ADOPTION AND IMPLEMENTATION OF SCREENING, BRIEF INTERVENTION, AND REFERRAL TO TREATMENT

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Kelli Marie Thoele

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SCREENING, BRIEF INTERVENTION, AND REFERRAL TO TREATMENT

More than 20 million people in the United States have a substance use disorder, resulting in negative individual and societal outcomes. An evidence-based intervention, Screening, Brief Intervention, and Referral to Treatment (SBIRT), involves screening patients to assess for substance use and then providing a brief intervention and referral to treatment when indicated. This evidence-based intervention is underutilized in healthcare settings. The purpose of this dissertation was to contribute to the body of evidence regarding the implementation of SBIRT in healthcare settings. Specifically, the aims of this dissertation were to 1) provide an overview of the evidence regarding the use of implementation strategies to facilitate the implementation of SBIRT, 2) describe implementation of SBIRT by nurses in acute care hospitals, and 3) examine individual and organizational characteristics associated with the intra-organizational adoption of SBIRT.

To review the literature, a scoping review was completed on 18 articles that met the inclusion criteria. The review found that leaders often train and educate stakeholders to facilitate the implementation of SBIRT, but less attention has been given to adapting the intervention or engaging patients. Additionally, implementation efforts led to increases in screening, but the evidence regarding the effect on brief intervention is inconclusive, and evidence regarding referral to treatment is scarce.

Eighteen nurses participated in a qualitative descriptive study of the implementation of SBIRT, and data were analyzed using content analysis. Participants

identified barriers and facilitators associated with the nurses' attitudes and beliefs about SBIRT, organizational factors, and patients' response to the SBIRT process. Participants indicated that SBIRT was a useful intervention that was best implemented by providing a clear process and incorporating SBIRT into an established workflow.

To examine factors related to intra-organizational adoption of a tool to screen patients for substance use, two hundred twenty-two nurses participated in a cross-sectional study. Results of this study indicate that training and the perception of peer usage of the intervention were significantly related to individual nurses' use of the intervention in practice. The findings of this dissertation can inform research and practice regarding the implementation of SBIRT in healthcare settings.

Robin Newhouse, PhD, RN, NEA-BC, FAAN, Chair

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LIST OF ABBREVIATIONS

Abbreviation	**Term**
AUDIT	Alcohol Use Disorders Identification Test
EBP	Evidence-based Practice
CI	Confidence Interval
DAST	Drug Abuse Screening Test
OR	Odds Ratio
SAMHSA	Substance Abuse and Mental Health Services Administration
SBIRT	Screening, Brief Intervention, and Referral to Treatment
SUD	Substance Use Disorder(s)

CHAPTER 1

Introduction

Evidence-based practice (EBP) is the integration of evidence from research, clinician expertise, and patient preferences and values to make decisions about how healthcare providers provide care (Melnyk & Fineout-Overholt, 2019). EBP leads to improved patient outcomes, greater clinician satisfaction, and reduced healthcare costs (Melnyk & Fineout-Overholt, 2015). The Institute of Medicine (2009) stated that 90% of clinical decisions should be evidence-based by 2020 and healthcare providers have favorable attitudes towards EBP (Arumugam et al., 2018; Verloo et al., 2017), but fewer than half of nurses report that their peers consistently implement EBP (Melnyk et al., 2012). Additionally, the lag between research and practice is reported to be 17 years, although the exact timeframe is difficult to define and measure (Balas & Boren, 2000; Morris et al., 2011).

Evidence-based care is lacking for people with substance use disorders (SUD). More than 20 million people in the United States have a SUD, defined as "impairment caused by the recurrent use of alcohol or other drugs (or both), including health problems, disability, and failure to meet major responsibilities at work, school, or home" (Substance Abuse and Mental Health Services Administration [SAMHSA], 2019, p. 32). An evidence-based intervention called Screening, Brief Intervention, and Referral to Treatment (SBIRT) results in significant decreases in alcohol and drug use (Aldridge et al., 2017), but this intervention is underutilized. Healthcare providers rarely use formal screening tools to screen for substance use (Agley et al., 2018), and fewer than 20% of

people who needed substance use treatment received any treatment in the past year (SAMHSA, 2019).

To increase the use of SBIRT in clinical settings, it is necessary to study how to implement SBIRT effectively. Implementation, or the integration of evidence-based interventions into a setting, is a complex process that involves a decision to use the intervention (i.e., adoption), methods to promote implementation (i.e., implementation strategies), and continued use of the intervention (i.e., sustainment) (Chambers et al., 2013; Powell et al., 2015; Proctor et al., 2013; Rabin et al., 2008; Wisdom et al., 2014). Implementation of SBIRT has been studied in emergency department and primary care settings, but less is known about the implementation of SBIRT in acute care settings.

Background and Significance

Substance use is common in people aged 12 and older in the United States, with 164.8 million people (60.2%) having used a substance such as alcohol, tobacco, or illicit drugs in the past month, including 16.6 million heavy drinkers, 67.1 million binge drinkers, and 31.9 million people who used illicit drugs in the past month (SAMHSA, 2019). Approximately 7.8% of adolescents/adults have a SUD, which is characterized by impairments and failure to meet responsibilities due to substance use (SAMHSA, 2019). This problem is not limited to the United States, and alcohol use is one of the leading causes of preventable death and disability globally (GBD 2016 Alcohol Collaborators, 2018). In the United States, substance use costs approximately $740 billion each year due to lost worker productivity, healthcare costs, and crime (National Institute on Drug Abuse, 2020).

SUD can be treated with a combination of medication, counseling, and medical and mental health services (National Institute on Drug Abuse, 2019). To identify SUD and initiate treatment, SBIRT provides a comprehensive and evidence-based approach in three steps:

1) The healthcare provider uses a validated screening tool such as the Alcohol Use Disorders Identification Test (AUDIT) or Drug Abuse Screening Tool (DAST) to screen for substance use.
2) Based on the results of the screening tool and clinical judgment, the healthcare provider provides a brief intervention to people with unhealthy substance use.
3) The healthcare provider refers people to specialty treatment when indicated.

The evidence for SBIRT is complex due to variations in substance types, the severity of unhealthy use, and delivery of a brief intervention; however, overall SBIRT is effective for the reduction of alcohol and illicit drug use (Aldridge et al., 2017). The U.S. Preventive Services Task Force (2018) recommends screening all adult patients in primary care for unhealthy alcohol use and providing a brief intervention when indicated, and the American College of Surgeons Committee on Trauma (2007) has a similar recommendation for trauma centers. Several organizations, including the Centers for Medicare and Medicaid Services (2019), the Centers for Disease Control and Prevention (2014), the National Institute on Alcohol Abuse and Alcoholism (2019), and the National Institute on Drug Abuse (2018), support the use of SBIRT.

Overview of the Literature

SBIRT is an effective (Aldridge et al., 2017) and cost-effective (Barbosa et al., 2015; Quanbeck et al., 2010) intervention for SUD with an overarching goal of preventing harm associated with substance use. While SBIRT is used for people with a primary diagnosis of SUD, there is also value in using SBIRT for people presenting to healthcare settings with primary diagnoses other than SUD (Makdissi & Stewart, 2013; Savage & Finnell, 2013). People presenting to acute care settings have higher rates of SUD than the general public (Center for Health Information and Analysis, 2019; SAMHSA, 2019), and healthcare providers can address SUD with these people. Despite the evidence to support the effectiveness and cost-effectiveness of SBIRT, and the evidence to support the need for SUD care in healthcare recipients, SBIRT is underutilized. The lack of use of an evidence-based intervention leads to a need to evaluate the implementation of SBIRT in healthcare settings.

One area of implementation science includes the use of implementation strategies, or methods to promote the implementation of SBIRT (Proctor et al., 2013). These strategies may include efforts such as auditing and providing feedback, identifying and preparing champions, or training and educating stakeholders (Powell et al., 2015; Waltz et al., 2015). In primary care settings, evidence suggests that the use of multi-faceted and higher intensity implementation strategies is the most effective approach to the successful implementation of SBIRT (Keurhorst et al., 2015; Nilsen et al., 2006). In emergency department settings, the use of multiple implementation strategies has also led to increases in the use of SBIRT (Bernstein et al., 2007; Mello et al., 2009; Salvalaggio et al., 2015), but this was not always sustained over time (Mello et al., 2009). Investigators

have studied the implementation of SBIRT in acute care settings, with a primary focus on trauma patients (e.g., Mello et al., 2013; Thomas et al., 2016; Whitty et al., 2015; Zimmermann et al., 2018). SBIRT is effective in hospitalized patients (McQueen et al., 2011), but little attention is given to the implementation of SBIRT for non-trauma patients in acute care settings.

Components of SBIRT are conducted by a variety of healthcare providers, including physicians, nurses, and social workers (Nunes et al., 2017). The largest number of healthcare employees are nurses (U.S. Bureau of Labor Statistics, 2015), and all nurses have the knowledge and skills to contribute to an interprofessional approach to the prevention and treatment of substance use (Bratberg et al., 2018). Specifically, nurses have the competencies to assess patients and use valid and reliable tools to screen for risk factors related to substance use, actual unhealthy substance use, and health problems associated with substance use. Additionally, nurses can use established protocols to provide care for patients at risk of withdrawal, discuss substance use with patients, and collaborate with interdisciplinary teams to identify referral sites and refer patients to treatment (Finnell et al., 2019). Hospitalized patients also report that they feel comfortable disclosing substance use to nurses (Broyles, Rosenberger, et al., 2012). Researchers have identified potential barriers and facilitators to SBIRT implementation by nurses in acute care settings (Broyles, Rodriguez, et al., 2012), but less is known about the actual implementation of SBIRT by nurses in acute care settings.

An initial step of implementation is the adoption of the intervention. Adoption is a decision-making process by which organizations, groups, or individuals decide to proceed with a new practice, process, or way of working (Greengalgh et al., 2004;

Wisdom et al., 2014). The adoption decision is generally influenced by the external system, characteristics of the organization, characteristics of the intervention or innovation, or characteristics of individuals (Wisdom et al., 2014). Decisions made at an organizational-level do not necessarily lead to similar decisions by individuals working within that organization (Frambach & Schillewaert, 2002; Gallivan, 2001), and the gap between the organizational and individual decisions is influenced by organizational facilitators, and the individual employee's characteristics (Frambach & Schillewaert, 2002; Aarons, 2005). The current literature on implementation of SBIRT often focuses on organizational-level outcomes, with less focus on the decisions made by individual providers within the organization (e.g., Anderson et al., 2016; Bendsten et al., 2016; Lapham et al., 2012).

Purpose

The purpose of this dissertation is to contribute to the literature regarding the adoption and implementation of SBIRT in healthcare settings. The dissertation addresses this purpose in the following ways:

- Chapter 2 describes a scoping review to provide an overview of existing evidence regarding the use of implementation strategies when implementing SBIRT in healthcare settings.
- Chapter 3 describes a qualitative descriptive study of the implementation of SBIRT by nurses working in acute care hospitals.
- Chapter 4 describes a cross-sectional study of individual and organizational characteristics associated with the intention to use SBIRT and actual use of SBIRT in acute care.

- Chapter 5 provides a synthesis of the findings of this dissertation, addresses the strengths and limitations of the dissertation, and makes recommendations for future research.

Theoretical and Philosophical Influences

Several theories have informed the development of this dissertation. The Conceptual Model for Considering the Determinants of Diffusion, Dissemination, and Implementation of Innovations in Health Services Delivery and Organization (Greenhalgh et al., 2004) provides a framework to study implementation in healthcare settings. In this model, an innovation is something new to the organization, and implementation of each innovation is a complex process influenced by system antecedents for change, system readiness for the innovation, and the outer context. Adoption and assimilation occur within the system, and there are several intended and unintended consequences of implementation (Greenhalgh et al., 2004). When considering the intention and behavior of individuals within the system or organization, The Theory of Planned Behavior (Azjen, 1991), the Conceptual Framework of Innovation Acceptance in Organizations (Frambach & Schillewaert, 2002), and the Conceptual Framework of the Role of Attitudes in Innovation Acceptance and Evidence-Based Practice Implementation in Organizations (Aarons, 2005) informed this dissertation. These models generally address the factors that influence the intention of individuals, which is an antecedent to actual behavior change. The qualitative study in this dissertation draws from a naturalistic inquiry approach to understanding behavior. In this approach, the researcher does not manipulate variables or commit to a specific theoretical view, but instead studies the topic in as natural of a state as possible (Lincoln & Guba, 1985).

CHAPTER 2

Background

More than 20 million people aged 12 and older in the United States have a substance use disorder (Substance Abuse and Mental Health Services Administration [SAMHSA], 2019). Substance use disorders (SUD), defined as health problems, disability, and failure to meet responsibilities caused by alcohol or drug use (SAMHSA, 2019), have a significant impact on individuals, families, and communities. In addition to healthcare costs associated with the treatment of comorbidities, a projected $42 billion will be spent on SUD treatment in 2020 (SAMHSA, 2014). When including direct and indirect costs related to crime and lost worker productivity, the national cost of substance abuse increases to $740 billion annually (National Institute on Drug Abuse, 2020). Despite the known consequences of SUD, healthcare providers rarely use validated tools to screen patients for SUD, and only 11% of people who need substance use treatment receive treatment at a specialty facility (Agley et al., 2018; SAMHSA, 2019).

An evidence-based intervention referred to as Screening, Brief Intervention, and Referral to Treatment (SBIRT) is a comprehensive public health approach to delivering care for individuals who have or are at risk of developing SUD (SAMHSA, 2017). SBIRT is a three-step process that involves 1) using a validated tool to screen patients to assess the severity of substance use, 2) providing a brief intervention when indicated by screening and clinical judgment, and 3) providing a referral to treatment when appropriate (SAMHSA, 2017). SBIRT is effective at reducing SUD (Aldridge et al., 2017) and diminishes societal costs related to automobile accidents, arrests, incarcerations, work absences, and other factors (Barbosa et al., 2015; Quanbeck et al.,

2010). When comparing the pre and post outcomes of over 17,000 people who received SBIRT, the prevalence of alcohol use decreased by 35.6%, and the prevalence of illicit drug use decreased by 75.8% (Aldridge et al., 2017). Compared to usual care, a brief intervention is effective in the reduction of alcohol consumption (Kaner et al., 2018), although the evidence for other substances is unclear (Kaner et al., 2018; Young et al., 2014). Several organizations recognize the potential of SBIRT in addressing substance use (Centers for Disease Control and Prevention, 2014; Centers for Medicare and Medicaid Services, 2019; National Institute on Alcohol Abuse and Alcoholism, 2019; National Institute on Drug Abuse, 2018). Despite the evidence supporting SBIRT, this intervention is underutilized in healthcare settings (Agley et al., 2018; Covington et al., 2018; Jun, 2019).

When an intervention with demonstrated effectiveness is underutilized, the next step is to study the implementation of that intervention (Bauer et al., 2015; Lane-Fall et al., 2019). Greenhalgh et al. (2004) define implementation as "active and planned efforts to mainstream an innovation within an organization" (p. 582). This process includes the decision to use an intervention (described using the terms adoption, assimilation, acceptance, and uptake) (Aarons, 2005; Greenhalgh et al., 2004; Rabin et al., 2008; Wisdom et al., 2014), and continued use of the intervention (described using the terms sustainment and maintenance) (Aarons et al., 2011; Chambers et al., 2013; Rabin et al., 2008). The methods used to enhance adoption, implementation, and sustainment of a new practice are referred to as implementation strategies (Proctor et al., 2013). Implementation strategies may include activities such as training and educating stakeholders, adapting the intervention to fit the context, or providing interactive

assistance during the implementation process (Powell et al., 2015, Waltz et al., 2015). While there are several different measures to determine the outcomes associated with implementation (Proctor et al., 2011), the outcomes in this review include *reach* (i.e., the proportion of patients who received the intervention) and *adoption* (i.e., the proportion of individual providers, groups, or organizations that decided to use the intervention) (Glasgow et al., 1999; Stoutenberg et al., 2018).

Previous reviews on the use of strategies to support the implementation of SBIRT have focused on unhealthy alcohol use within primary care settings. These analyses indicated that the use of multi-faceted strategies that addressed a combination of patients, professionals, and organizations, was more effective than the use of strategies that only addressed the healthcare professionals (Keurhorst et al., 2015). These studies additionally found that a higher intensity of an implementation strategy (e.g., amount of training) was associated with greater efficacy of implementation of a brief alcohol intervention in primary care (Nilsen et al., 2006).

A recent review of strategies to support the implementation of SBIRT in multiple healthcare settings has not been conducted. Therefore, the research question guiding this research is, "What implementation strategies are used to increase the reach and adoption of SBIRT when implementing SBIRT in healthcare settings?" Scoping reviews map the current field of study and identify gaps in the existing literature (Arksey & O'Malley, 2005; Munn et al., 2018). A scoping review was therefore determined most appropriate, as this method will provide an overview of the evidence regarding the implementation of SBIRT in diverse healthcare settings**.** The purpose of this scoping review is to provide an

overview of existing evidence regarding the use of implementation strategies to promote the implementation of SBIRT in healthcare settings.

Methods

Investigators used a scoping review method as described by Arksey and O'Malley (2005). This method includes identifying a research question, identifying and selecting studies, extracting data, and then collating and summarizing results (Arksey and O'Malley, 2005).

Identifying a Research Question

The investigators noted a gap in the literature and established the research question. The investigators developed but did not publish a protocol to conduct the review and answer this research question.

Identifying and Selecting Studies

To be included in this review, articles had to be published in English, contain empirical evidence, address the implementation of SBIRT in healthcare settings, describe strategies to promote implementation, and measure an outcome of interest (i.e., reach or adoption of SBIRT). Additionally, there had to be a comparison of the outcome, such as pre-intervention and post-intervention data, longitudinal data, or comparison to a control group. Exclusion criteria included abstracts, posters, dissertations, or articles that used SBIRT for something other than unhealthy substance use. These inclusion and exclusion criteria were selected to obtain evidence to address the purpose of the review and to summarize evidence regarding the changes in reach and adoption related to the use of implementation strategies.

The articles for this review were identified through a literature search, using the key terms "SBIRT" OR "screening brief intervention referral to treatment" AND multiple terms related to implementation (adopt*, assimilation, acceptance, uptake, implement*, sustain*, maintenance). Because not all authors use the term 'strategy' when describing methods to enhance implementation, this term was not included in the search. Databases for the search included CINAHL Complete, HealthBusiness FullTEXT, PsycINFO, PubMed, and Embase. These databases were selected to capture nursing, healthcare administration, behavioral science literature, and international literature. Publication dates were not limited, and the literature search was conducted on August 31, 2019. A health science librarian provided feedback on the search strategy prior to the completion of the literature search.

The initial screening process included a review of all titles and abstracts and then removal of the citations that clearly did not meet the criteria for inclusion in the review. After obtaining the full text for all of the remaining citations, the investigator then removed all non-English articles, abstracts, posters, and dissertations. The remaining full-text articles were then screened for inclusion in the review using a screening tool that listed the inclusion and exclusion criteria (see Appendix A).

Extracting Data

Variables of interest for this review included the study theory or framework, design and timeline, location and setting, patient population, substance type, the type of providers using SBIRT, sample size and type, implementation strategies used, and implementation outcomes. Most of the variables (theory/framework, design and timeline, location, setting, population, substance type, and providers using SBIRT) were extracted

directly from the articles. When the study authors did not clearly state the study design, the reviewers selected a design to describe the study. The sample size and type were extracted directly from the article, with a focus on the sample size included in the final data analysis. When the study authors did not provide the exact sample size, the reviewers described the sample size based on information in the article.

To identify implementations strategies, the reviewers looked for descriptions of methods to facilitate adoption, implementation, or sustainment of SBIRT, such as training, adapting the intervention, providing ongoing support, or providing financial incentives. The implementation strategies described in each article were extracted and then categorized by the reviewers into categories, as defined and described by Powell et al. (2015) and Waltz et al. (2015). When reviewing the articles, research activities, such as data collection for research purposes and data analysis, were not considered to be implementation strategies. Funding and academic/practice partnerships were included as implementation strategies when they were explicitly mentioned in the article but were not included based on the acknowledgments section or authors' credentials or places of employment.

The outcomes of reach and adoption were extracted from each article. Although adoption is generally defined as a cognitive decision (Wisdom et al., 2014), researchers often measure self-reported behavior or actual behavior as a proxy for the adoption decision. For this review, reviewers extracted adoption data on providers' intention to use SBIRT or behavior regarding SBIRT. Study outcomes other than reach or adoption (e.g., provider attitude, knowledge, patient use of substances after receiving SBIRT) were not extracted from the articles. When extracting outcomes related to the brief intervention,

reviewers also included different terms used to describe a brief intervention, such as 'brief advice,' 'motivational interviewing,' and 'counseling.'

A data collection instrument was developed and built into Qualtrics XM ®, a cloud-based survey software tool, with pilot testing completed prior to use (see Appendix A). This tool was used to guide data extraction, collect and organize data from each article, and compare reviewer responses. Once reviewers determined that an article met criteria for inclusion in the review, each article was independently reviewed by the primary investigator and a second reviewer. Both reviewers entered data into the Qualtrics tool. The study timeline was not included in the original data collection tool, and this variable was extracted later in the scoping review process. At the completion of the independent reviews, all discrepancies were discussed by the two independent reviewers. All unresolved discrepancies were then brought to one of two additional investigators, who then made a final determination. One study author was contacted to clarify the substance type addressed in an article. In alignment with the scoping review methods described by Arksey & O'Malley (2005), reviewers did not appraise the quality of each article.

Collating and Summarizing Results

Once consensus was reached, the results were entered into a table in Microsoft Word to collate the results and summarize the data. The reviewers (KT, SK, ML, & LM) met in person to summarize the information, and all investigators provided additional input via email or in-person discussions.

Results

The literature search identified 462 unique records after the removal of duplicates. Two hundred sixty-eight articles were excluded based on a review of the titles and abstracts, and then a review of full-text citations led to the exclusion of abstracts, dissertations, and non-English articles. Two reviewers assessed the remaining 102 full-text articles for eligibility based on previously noted inclusion and exclusion criteria. The search concluded with 18 articles identified for in-depth review (see Figure 2-1).

Study Characteristics

The majority of studies (n=15) did not state a specific theory or framework; however, investigators of the remaining three studies noted the use of the following frameworks: Framework for Design and Evaluation of Complex Interventions to Improve Health, the Consolidated Framework of Implementation Research, and Knowledge Translation. The most common study designs were pre-post studies, randomized controlled trials, longitudinal studies, and quality improvement, with the timeframe of the studies ranging from 30 days to 5.5 years. Thirteen studies were conducted in the United States, followed by Europe (n=3), Canada (n=1), and Australia (n=1). The most common settings were primary care and emergency departments/trauma centers. The majority of the included patient populations were adults and/or trauma patients (n=10), although three of the studies addressed the implementation of SBIRT in the adolescents and pediatric populations. More than half of the studies were implementing SBIRT to address alcohol use, while the remaining studies focused on SBIRT to address alcohol and other drugs, tobacco, or all substance types. SBIRT was generally provided by multiple

professions within each study, although the studies in which only one profession provided SBIRT generally focused on physicians (see Table 2-1).

Implementation Strategies

The authors of each study described the use of multiple strategies to support the implementation of SBIRT. Nearly every study used strategies to train and educate stakeholders (n=17). Training and education included the development and distribution of educational materials, as well as the provision of in-person training ranging from 5 minutes to 1 full day. While training and education were used most often, the next most common approach was the development of stakeholder interrelationships (n=12). Studies described developing these relationships through the identification of champions, development of interdisciplinary teams, and collaboration with researchers and other stakeholders (see Table 2-2).

Half of the studies described strategies to support clinicians (n=9), such as embedding reminders into the electronic health record and shifting tasks from one role (e.g., physician) to a different role (e.g., research assistant, health education specialist, or behavioral health care practitioner). Other strategies used included the use of evaluative and iterative strategies to support implementation (n=9), such as the use of monthly or quarterly reports to summarize data, and the completion of a baseline needs assessment to assess for readiness for the implementation of SBIRT (see Table 2-2).

The remaining categories of implementation strategies were used in fewer than half of the studies. These included the use of interactive assistance to support implementation (n=8) by providing technical assistance, conducting one-time or monthly conference calls, or by providing ongoing support, facilitation, and supervision. Several

studies also described adapting and tailoring the intervention or implementation plan to the local context (n=8). Implementation leaders most commonly tailored the resources, intervention, process, and training materials to meet the local needs or to fit into a specific setting (e.g., community emergency department) or specific population (e.g., Indigenous people). Another approach included the use of strategies to change infrastructure (n=8). The most common infrastructure change was the modification of the electronic health record to incorporate SBIRT into the documentation. Several studies described the use of financial strategies (n=7) to increase the use of SBIRT. Financial strategies included receiving funding to support the implementation of SBIRT or providing incentives or reimbursement for the use of SBIRT. Finally, a few studies described the engagement of consumers to support implementation (n=3) by partnering with people with unhealthy substance use or people from a specific population (i.e., Indigenous people) to develop resources and train providers (see Table 2-2).

Implementation Outcomes

The majority of the studies in this review measured the percentage of patients who received the intervention (n= 15), while one of these studies additionally measured differences in adoption among providers. The remaining three studies measured the self-reported use of SBIRT by providers. Most of the studies in this scoping review evaluated outcomes related to screening (n=15), followed by brief intervention (n=10), referral to treatment (n=4), brief intervention/referral to treatment (n=1), and SBIRT overall (n=2) (see Table 2-1).

Screening

Reach. Of the 15 studies measuring outcomes related to screening patients with a valid and reliable tool, most of the studies measured *reach*, or the percentage of patients who received screening (n=13). Most of these studies (n=9) utilized the same implementation strategies for all study participants via a quality improvement, pre-post, or longitudinal study design. In these studies, screening generally increased over time (Lindholm et al., 2010; Mello et al., 2013; Muench et al., 2015; Rieckmann et al., 2018; Thomas et al., 2016; Whitty et al., 2015; Zimmermann et al., 2018), but three studies did not report if this increase was significant (Mello et al., 2013; Rieckmann et al., 2018; Zimmermann et al., 2018). Only one study, which focused on parents of patients rather than patients, reported no change in screening (Sharifi et al., 2014). Another study reported an increase in screening when a research assistant was present, then a return to baseline when the research assistant was no longer present (Mello et al., 2009).

The remaining studies (n=4) divided participants into groups and evaluated outcomes using randomized controlled, randomized controlled pre-post, or non-randomized pre-post quasi-experimental designs. The use of training (Anderson et al., 2016; Henihan et al., 2016) and financial reimbursements (Anderson et al., 2016) resulted in significant increases in screening, but the opportunity to adapt the brief intervention did not result in changes in the percentage of patients who were screened (Anderson et al., 2016; Bendsten et al., 2016). When non-physician providers and physicians were exposed to the same implementation strategies, a higher percentage of patients were screened by non-physician providers than physicians (Mertens et al., 2015).

Adoption. Two studies examined the adoption of screening by providers. One study found that physicians at the completion of the study were more likely to screen than at the beginning of the study. However, the adoption of screening was not significantly different between the intervention group and the control group in this study (Salvalaggio et al., 2015). In contrast, another study found that providers who attended more training sessions were significantly more likely to screen patients for substance use than providers who attended fewer training sessions (Sterling et al., 2015).

Brief Intervention

Reach. Seven out of the 10 studies reporting outcomes related to the brief intervention measured the percentage of patients who received the brief intervention. Most of these studies (n=5) used the same implementation strategies for all study participants using a quality improvement, pre-post, longitudinal study design, or retrospective design. The results of these studies differed; while the percentage of patients receiving the brief intervention significantly increased in one study (Sharifi et al., 2014), other studies demonstrated no change in reach (Muench et al., 2015; Thomas et al., 2016; Whitty et al., 2015). A retrospective study evaluating a new nationwide performance measure (supported by electronic decision support and financial incentives) demonstrated a significant increase in reach of the brief intervention. However, this study does not assess or describe implementation strategies used within each facility to promote the use of SBIRT (Lapham et al., 2012).

The remaining studies on the reach of the brief intervention (n=2) compared different implementation strategies between and among groups. In a randomized controlled trial, reach was higher in the intervention group than the control group, but it is

not clear if this difference was statistically significant (Henihan et al., 2016). Adapting the intervention to allow for an electronic brief intervention did result in a significant increase in the percentage of patients who received a brief intervention overall (Bendsten et al., 2016).

Adoption. Three studies measured the adoption of brief intervention by providers. More providers reported using the brief intervention after exposure to the implementation strategies (Egizio et al., 2019; Salvaloggio et al., 2015), and providers who attended more training sessions were more likely to use the brief intervention than their peers who attended fewer training sessions (Sterling et al., 2015).

Referral to Treatment

Reach. Of the four studies reporting outcomes related to the percentage of patients who received a referral to treatment, most measured reach (n=3). There was not a notable change in referral to treatment for two studies (Henihan et al., 2016; Whitty et al., 2015), but Sterling et al. (2015) found that embedding a behavioral health care practitioner into primary care resulted in a significantly lower percentage of patients receiving a referral to treatment than patients receiving usual care.

Adoption. In one study of provider adoption of referral to treatment, Salvalaggio et al. (2015) noted a significant increase over time in the overall percentage of physicians reporting that they refer patients to treatment. This outcome, however, was not significantly different between the intervention and control groups.

Brief Intervention/Referral to Treatment

Adoption. Mertens et al. (2015) measured the outcome, brief intervention/referral to treatment, based on documentation of either a brief intervention or a referral to

treatment. Evidence suggests that physicians may be more likely to provide a brief intervention/referral to treatment than non-physician providers, but the physicians in this study were also less likely to screen patients than non-physician providers (Mertens et al., 2015).

SBIRT

Adoption. Two studies did not differentiate screening, brief intervention, and referral to treatment as three separate interventions, but instead asked providers about their use of SBIRT overall before and after exposure to implementation strategies. In both studies, providers reported an increase in the use of SBIRT (Bernstein et al., 2007; Egizio et al., 2019, although the reported use of SBIRT 12 months after the intervention was not as high as the reported use of SBIRT 3 months after the intervention (Bernstein et al., 2007).

Discussion

SUD are common and detrimental to individuals and society as a whole. SBIRT, an evidence-based intervention with demonstrated effectiveness, is underutilized in healthcare settings. Different implementation strategies may be used to increase the delivery of SBIRT to patients or the use of SBIRT by providers, but there had not been a recent review of the evidence. This scoping review included 18 articles and was guided by the research question, "What implementation strategies are used to increase the reach and adoption of SBIRT when implementing SBIRT in healthcare settings?"

The majority of the studies were conducted in the United States and focused on screening and providing a brief intervention for alcohol use in the emergency department and primary care settings. These study characteristics align with the recommendations for

practice from the American College of Surgeons Committee on Trauma (2007) and the U.S. Preventive Services Task Force (2018). There is a gap, however, in the existing literature about the implementation of SBIRT in acute care settings. When compared to the general population, patients admitted to the hospital have higher rates of SUD (Center for Health Information and Analysis, 2019; SAMHSA, 2019). McQueen and colleagues (2011) contend that when a brief intervention for heavy alcohol is used in hospitalized patients, this intervention can lead to a reduction in alcohol consumption and death rates. Additionally, The Joint Commission quality measures for hospitalized adult patients support and recommend screening and providing a brief intervention for unhealthy alcohol use (2019).

While most of the studies did not state a theory used to guide the study, each study described a multi-modal approach with the use of various strategies to support implementation. Numerous studies included strategies to train stakeholders and develop stakeholder interrelationships, but less attention has been given to adapting and tailoring SBIRT. There are core components of SBIRT that must remain the same to maintain fidelity to the intervention, but the peripheral components of SBIRT (e.g., who completes the screening, how the brief intervention is provided) can be adapted to fit the organizational context. Bendsten et al. (2016) found that allowing providers to select between an electronic brief intervention or a face-to-face brief intervention was associated with an increase in the percentage of patients who received a brief intervention. SBIRT is a multi-step intervention that involves multiple professions and teamwork. More research about adapting the intervention or implementation process may be beneficial to increase the reach and adoption of SBIRT. Of note, only a few studies

engaged patients or other consumers in the implementation process. Providers and patients report discomfort discussing substance use as a barrier to the implementation of SBIRT (McNeely et al., 2018), but 95% of hospitalized patients reported that they would feel comfortable if a nurse discussed alcohol use with them (Broyles, Rosenberger, et al., 2012). There is a potential to enhance implementation by further researching adaptation of SBIRT and patient and consumer engagement.

When evaluating outcomes associated with the implementation of SBIRT, most of the studies evaluated organizational or group-level outcomes and did not evaluate provider-level outcomes. Nevertheless, the factors influencing individual providers' decisions about the adoption of an intervention differ from the factors influencing organizational decisions (Aarons et al., 2005). Additionally, the use of SBIRT may increase initially and then decrease over time (Bernstein et al., 2007; Mello et al., 2009), but there is a paucity of research on the sustainment of SBIRT. This review also revealed that the use of implementation strategies is generally associated with increases in the reach and adoption of screening, but evidence about the brief intervention is inconclusive, and evidence regarding the referral to treatment is scarce.

Limitations

There are several limitations of this scoping review. Only one reviewer screened all of the titles and abstracts, and therefore some studies may have been inaccurately excluded from the study. The reviewers also extracted implementation strategies from each article and then selected categories for each strategy, but the categories selected by the reviewers may not reflect the actual intention of investigators in the original study. As the method did not include an appraisal of the quality of evidence, the results of this

scoping review indicate gaps in the evidence but does not draw conclusions regarding the effectiveness of different implementation strategies.

Conclusion

In summary, most of the empirical evidence about the implementation of SBIRT in healthcare settings is from studies conducted in the United States in primary care and emergency department settings. Healthcare leaders and researchers often train and educate stakeholders and use strategies to develop stakeholder interrelationships, but there is a lack of empirical evidence about adapting the intervention or engaging consumers. Finally, researchers often measure the reach of screening and the brief intervention, with less focus on adoption of SBIRT by providers or reach and adoption of referral to treatment.

Figure 2-1
Flow Diagram of Study Selection

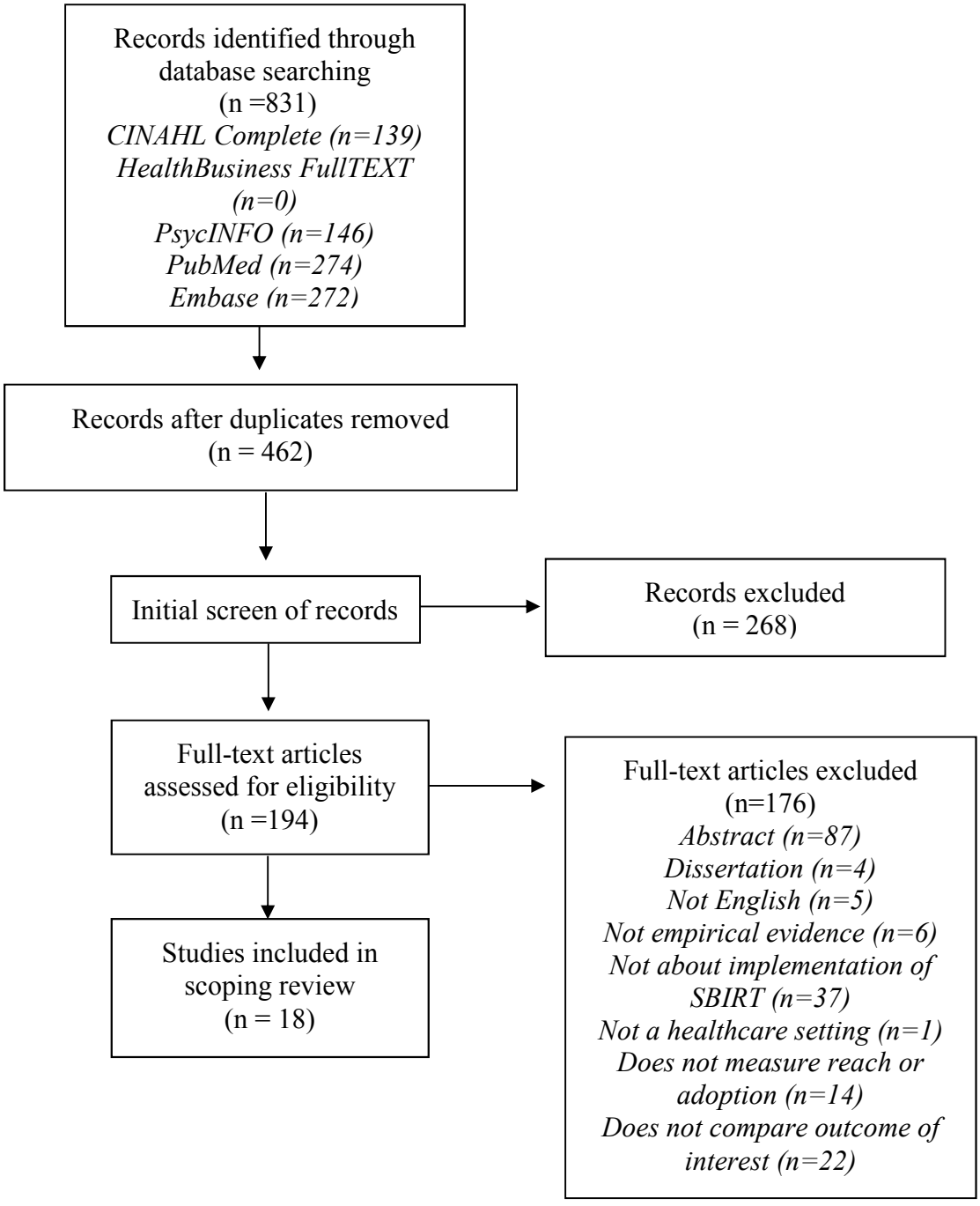

Table 2-1
Key Features of Included Studies

Article	Theory, Design, Timeline, Location, and Setting	Population, Substance Type, Providers, and Sample	Outcomes
Anderson et al., 2016	Theory: None Design: Cluster randomized 2x2x2 factorial trial Timeline: 4 weeks (baseline) 12 weeks (implementation) Location: Catalonia, England, the Netherlands, Poland, Sweden Setting: 120 primary healthcare centers	Population: Adults Substance Type: Alcohol Providers: Providers (general practitioners, nurses, or other professionals) Sample: Approximately 5,000-20,000 registered patients at the healthcare centers Average of 1,500 consultations at each center per month	Screening significantly increased in groups that received training/support (Groups 2, 5, 6, 8) compared to groups that did not. Screening significantly increased in groups who received financial reimbursement (Groups 3,5,7, 8) compared to groups that did not. Not a significant increase in screening for the groups that received the electronic brief intervention (Groups 4, 6, 7, 8) compared to groups that did not.
Bendsten et al., 2016	Theory: None Design: Sub-analysis of a randomized controlled trial Timeline: 4 weeks (baseline) 12 weeks (implementation) Location: Catalonia, England, the Netherlands, Poland, Sweden Setting: 120 primary healthcare centers	Population: Adults Substance Type: Alcohol Providers: Providers (general practitioners, nurses, or other professionals) Sample: Approximately 5,000-20,000 registered patients at the healthcare centers Average of 1,500 consultations at each center per month	Not a significant increase in screening for the groups that received the electronic brief intervention (Groups 4, 6, 7, 8) compared to groups that did not. Significant increase in proportion of patients who received brief advice in the sample as a whole (70% to 80%, $p<0.05$).

Article	Theory, Design, Timeline, Location, and Setting	Population, Substance Type, Providers, and Sample	Outcomes
Bernstein et al., 2007	Theory: None Design: Pre-post- repeated measures design Timeline: 12 months Location: United States Setting: 14 academic emergency departments	Population: Emergency department patients Substance Type: Alcohol Providers: Providers (physicians, registered nurses, advanced practice providers, social workers, and other staff) Sample: 288 providers	Significantly higher utilization of SBIRT skills 3 months ($p<0.001$) and 12 months ($p<0.001$) after receiving education, when compared to baseline. Providers reported higher utilization of SBIRT skills at 3 months than 12 months.
Egizio et al., 2019	Theory: None Design: Pre-post* Timeline: 30 days Location: United States Setting: Field placement of supervisors (e.g., family service agencies, hospitals, community clinics, housing programs)	Population: All patients coming in contact with field supervisors Substance Type: Alcohol and other drugs Providers: Social workers who provided field supervision to social work students delivering SBIRT Sample: 74 field supervisors	Increase in the percentage of supervisors who used motivational interviewing (73.9% to 86.5%) and SBIRT (17.4% to 43.2%) when comparing baseline to 30 days after training.
Henihan et al., 2016	Theory: Framework for Design and Evaluation of Complex Interventions to Improve Health Design: Randomized controlled pre-and-post design Timeline: 3 months Location: Ireland Setting: 15 primary care facilities	Population: Adults receiving addiction treatment with an opioid agonist Substance Type: Alcohol Providers: General practitioners Sample: 81 patients (34 in the intervention group and 47 in the control group)	A higher percentage of patients in the intervention group were screened (53% versus 26%), received a brief intervention (47% versus 19%) and received a referral to treatment (3% versus 0%) when compared to the control group

Article	Theory, Design, Timeline, Location, and Setting	Population, Substance Type, Providers, and Sample	Outcomes
Lapham et al., 2012	Theory: None Design: Retrospective, natural history study Timeline: 12 months (baseline) 3 months (transition) 3 months (implementation) 9 months (dissemination) Location: United States Setting: Outpatient Veteran Affairs facilities	Population: Veterans Substance Type: Alcohol Providers: Providers Sample: 6,788 patients who screened positive for alcohol misuse	The percentage of patients receiving a brief intervention increased significantly over time from 5.5% to 29% ($p < 0.001$).
Lindholm et al., 2010	Theory: None Design: Pre-post* Timeline: 12 months (pre-intervention) 12 months (post-intervention) Location: United States Setting: 18 primary care clinics	Population: Adults Substance Type: Tobacco Providers: Medical assistant completed screening, clinicians provided brief intervention Sample: 502,359 patients (255,138 pre-intervention and 247,221 post-intervention)	Statistically significant increase in documentation of smoking status from 71.6% to 78.4% ($p < 0.001$). Pre-intervention data not available for brief intervention or referral to treatment.

Article	Theory, Design, Timeline, Location, and Setting	Population, Substance Type, Providers, and Sample	Outcomes
Mello et al., 2009	Theory: None Design: Quality improvement* Timeline: 1 month (baseline), 6 months (Phase 1), 6 months (Phase 2) Location: United States Setting: 1 community hospital emergency department	Population: Not a specific population Substance Type: Alcohol Providers: Physicians, physician assistants, and nurse practitioners provided the screening and referral. Research assistants provided the brief intervention Sample: 1509 patients (254 baseline, 922 when research assistant was present, 333 patients one month after the research assistant was no longer present)	Screening by emergency department staff increased from 50% (baseline) to 71% (when research assistant was present), then back to 50% after research assistant was no longer present.
Mello et al., 2013	Theory: None Design: Longitudinal* Timeline: 12 months (adoption) 12 months (implementation) 12 months (maintenance) Location: United States Setting: 7 pediatric trauma centers	Population: Admittd adolescent trauma patients Substance Type: Alcohol Providers: Differed at each site, but in general, nurses completed screening and social workers provided brief intervention and decided on referral to treatment Sample: 400 patients (160 baseline, 116 in implementation phase, 124 in maintenance phase)	The percentage of patients screened increased from 11% (baseline) to 73% (implementation and maintenance phases).

Article	Theory, Design, Timeline, Location, and Setting	Population, Substance Type, Providers, and Sample	Outcomes
Mertens et al., 2015	Theory: None Design: Cluster randomized implementation trial Timeline: 12 months Location: United States Setting: 54 primary care clinics	Population: Adults Substance Type: Alcohol Providers: Arm 1: Physicians Arm 2: Non-physician providers (i.e., clinical health educators, behavioral medicine specialists, nurses) and medical assistants Arm 3: Usual care Sample: Average number of visits per month=35,519 patients in Arm 1, 34,167 patients in Arm 2, 31,935 patients in Arm 3	Screening was highest in Arm 2 (51%) compared to Arm 1 (9%) and Arm 3 (3.5%). For patients screening positive, the brief intervention and referral was highest in Arm 1 (44%) compared to Arm 2 (3.4%) and Arm 3 (2.7%).
Muench et al., 2015	Theory: None Design: Longitudinal* Timeline: 2 years Location: United States Setting: 6 primary care clinics	Population: Adults Substance Type: Alcohol and other drugs Providers: Receptionists gave annual screen to patients at check-in Medical assistants scored the screen, and if indicated, completed a more detailed brief assessment Clinicians (physician, physician's assistant, nurse practitioner) performed the brief intervention Sample: Approximately 11,000 patients each quarter	Screening rates significantly increased over time, with a median increase of 6.4% between quarters ($p<0.05$). Brief assessment rates (AUDIT and/or DAST) increased over time, with a median increase of 7.0% between quarters ($p<0.05$). Brief intervention rates decreased over time, with a decrease of 3.7% between quarters. A non-significant trend ($p>0.05$).

Article	Theory, Design, Timeline, Location, and Setting	Population, Substance Type, Providers, and Sample	Outcomes
Rieckmann et al., 2018	Theory: Consolidated Framework of Implementation Research Design: Longitudinal mixed- methods design Timeline: 30 months (pre-implementation) 6 months (transition period) 30 months (post-implementation) Location: United States Setting: Primary care	Population: 18-64 year old Medicaid recipients enrolled in a coordinated care organization Substance Type: Alcohol and other drugs Providers: Unknown Sample: 516,708 members in the study population	Quantitative analysis revealed a significant increase in SBI rates from 0.1% of patients (baseline) to 4.6% of patients (last six months of study). Qualitative analysis revealed the importance of aligning incentives, workflow redesign, and leadership facilitation.

Article	Theory, Design, Timeline, Location, and Setting	Population, Substance Type, Providers, and Sample	Outcomes
Salvalaggio et al., 2015	Theory: Knowledge Translation Design: Non-randomized, pre-post, quasi-experimental intervention design Timeline: 6 months (patient-level implementation) 6 months (provider access to knowledge translation resources) Location: Canada Setting: 3 primary care networks, 3 emergency departments, 3 residency programs	Population: Patients who received care in socio-economically disadvantaged neighborhoods Substance Type: Alcohol and other drugs Providers: Physicians/ residents Sample: 64 physicians/residents (39 in the intervention group and 25 in the control group)	Overall, physicians reported that they were more likely to screen ($p=0.008$) and refer for treatment ($p=0.017$) after 12 months. Exposure to the intervention predicted brief intervention behavior ($p<0.05$) but not screening or referral behavior.
Sharifi et al., 2014	Theory: None Design: Pre-post study Timeline: 3 months (pre-intervention) 1 month (intervention) 3 months (post-intervention) Location: United States Setting: 1 pediatric primary care clinic	Population: Parents (of pediatric patients ≤12 years old) who smoke Substance Type: Tobacco Providers: Physicians/ residents Sample: 3919 patients (2024 pre-intervention and 1895 post-intervention)	Not a significant change in screening. There was a significant increase in counseling for parents who screened positive.

Article	Theory, Design, Timeline, Location, and Setting	Population, Substance Type, Providers, and Sample	Outcomes
Sterling et al., 2015	Theory: None Design: Cluster randomized controlled trial Timeline: 2 years Location: United States Setting: 1 pediatric primary care system	Population: Adolescents 12-18 years old Substance Type: Alcohol, tobacco, other drugs Providers: Arm 1: Pediatricians Arm 2: Pediatricians and embedded behavioral health care practitioners Arm 3: Usual care Sample: 1871 patients (584 in Arm 1, 671 in Arm 2, 616 in Arm 3)	In Arm 1, pediatricians who attended 2+ trainings assessed more patients than pediatricians who attended fewer trainings ($p<0.001$) and provided more brief interventions ($p<0.001$) than pediatricians who attended fewer trainings. The total number of assessments in Arm 1 and Arm 2 were not significantly different. Arm 1 and Arm 2 provided significantly more brief interventions than Arm 3 ($p<.001$) Arm 1 provided more brief interventions related to substance use than Arm 2 ($p<0.001$). Arm 2 had significantly lower referral to treatment when compared to usual care ($p=0.006$), but Arm 1 was not significantly different from usual care
Thomas et al., 2016	Theory: None Design: Quality improvement (using Plan-Do-Study-Act) Timeline: 12 months Location: United States Setting: 1 emergency department and hospital	Population: Adult trauma patients Substance Type: Alcohol and other drugs Providers: Multiple roles provided SBIRT (including nurses and health education specialists), and the process changed throughout the project Sample: 1664 patients	The percentage of patients who were screened significantly increased over time from 47% (Quarter 1) to 86.1% (Quarter 2) ($p<0.001$) Specialist-delivered SBIRT (assessment and brief intervention when applicable) did not significantly change over time.

Article	Theory, Design, Timeline, Location, and Setting	Population, Substance Type, Providers, and Sample	Outcomes
Whitty et al., 2015	Theory: None Design: Mixed-method, uncontrolled, pre-post trial Timeline: 6 months (pre-intervention) 13 months (implementation) 6 months (post-intervention) Location: Australia Setting: 1 hospital	Population: Patients treated for alcohol-related injury and maxillofacial trauma; the majority of patients who met criteria at this hospital were Indigenous Substance Type: Alcohol Providers: Not specified (the best practice pathway was designed for medical, surgical and nursing departments) Sample: 144 patients (76 pre and 68 post)	Screening significantly increased from 9% to 81% of patients ($p \leq 0.001$). No significant change in brief intervention, internal referral, or external referral.
Zimmermann et al., 2018	Theory: None Design: Quality improvement* Timeline: 8 months Location: United States Setting: 1 trauma center	Population: Trauma patients 15+ years old Substance Type: Alcohol Providers: Blood alcohol levels used as a screening tool; if a patient screened positive (blood alcohol level > 0.02%) the social worker provided a brief intervention and evaluated for treatment services Sample: 693 patients	Screening increased from 30% (month 1) to 100% (months 4-8).

*= Authors did not state the design

Table 2-2
Implementation Strategies and Categories

Article	Implementation Strategies	Implementation Strategy Category								
		A	B	C	D	E	F	G	H	I
Anderson et al., 2016	Conducted one (10-30 minute) telephone support call (Groups 2, 5, 6, 8)		x							
	Offered an option to refer patients to an online brief intervention as an alternative to face-to-face intervention (Groups 4, 6, 7, 8)			x						
	Distributed educational materials (Groups 1, 2, 4, 5, 6, 7, 8)					x				
	Asked providers to screen patients (Groups 1, 2, 4, 5, 6, 7, 8)									
	Provided two (1-2 hour) in-person trainings (Groups 2, 5, 6, 8)									
	Provided financial reimbursement for screening/advice (Groups 3, 5, 7, 8)								x	
	Provided a record sheet to document SBIRT (Groups 1, 2, 4, 5, 6, 7, 8)									x
Bendsten et al., 2016	Conducted one (10-30 minute) telephone support call (Groups 2, 5, 6, 8)		x							
	Offered an option to refer patients to an online brief intervention as an alternative to face-to-face intervention (Groups 4, 6, 7, 8)			x						
	Distributed educational materials (Groups 1, 2, 4, 5, 6, 7, 8)					x				
	Asked providers to screen patients (Groups 1, 2, 4, 5, 6, 7, 8)									
	Provided two (1-2 hour) trainings (Groups 2, 5, 6, 8)									
	Provided financial reimbursement for screening/advice (Groups 3, 5, 7, 8)								x	
	Provided a record sheet to document SBIRT (Groups 1, 2, 4, 5, 6, 7, 8)									x
Bernstein et al., 2007	Provided technical assistance		x							
	Facilitated learning of individual clinicians									
	Tailored brief intervention and referral resources to meet local needs			x						
	Partnered with research team and stakeholders at each site				x					
	Provided one (2-hour) interactive workshop or a web-based learning module					x				
	Developed and distributed educational materials									
	Collaborated with volunteers from Alcoholics Anonymous							x		

Article	Implementation Strategies	Implementation Strategy Category								
		A	B	C	D	E	F	G	H	I
Egizio et al., 2019	Provided monthly implementation support		x							
	Facilitated clinical supervision									
	Tailored plan to address limited training and clinical supervision for SBIRT			x						
	Identified champions (i.e., field supervisors) and partnered with instructors				x					
	Provided one (1-day) training for field supervisors					x				
	Received grant to develop SBIRT certificate program								x	
Henihan et al., 2016	Partnered with the research assistant who conducted practice visits				x					
	Distributed training and educational materials					x				
	Demonstrated intervention implementation									
	Provided educational support after the workshop									
Lapham et al., 2012	Monitored quarterly facility-level reports	x								
	Disseminated clinical reminders via the electronic medical records						x			
	Linked performance measure to financial incentives for clinical leaders								x	
	Created a national performance measure for a brief intervention for patients with alcohol misuse									x
Lindholm et al., 2010	Completed pilot tests before wide-scale implementation	x								
	Developed a team of representatives from healthcare system (including a physician champion) and a university-based tobacco dependence research center				x					
	Provided one (20-minute) onsite training and an additional visit if needed					x				
	Listed interventions in the electronic medical record if patient indicated an interest in quitting						x			
	Modified the electronic medical record to improve identification and treatment of tobacco use									x

Article	Implementation Strategies	Implementation Strategy Category								
		A	B	C	D	E	F	G	H	I
Mello et al., 2009	Adapted plan to community emergency department environment (Phase 1) Continued ongoing exploration and adaptation (Phases 1, 2)			x						
	Met with stakeholders to obtain feedback on intervention and implementation plan (Phase 1)				x					
	Provided one (5-minute) initial training of staff (Phase 2) Provided small laminated reference cards (Phase 2)					x				
	Partnered with the research assistant, who provided the brief intervention (Phase 2)						x			
Mello et al., 2013	Assessed for readiness and created an SBIRT policy (Adoption phase)	x								
	Facilitated monthly conference calls (Adoption and implementation phases) Hosted a web site for technical assistance (Adoption and implementation phases)		x							
	Identified and prepared site leaders (Adoption phase)				x					
	Provided online curriculum and in-person workshop (Adoption phase)					x				
	Provided another in-person workshop and webinar on the brief intervention (Implementation phase)									
Mertens et al., 2015	Reviewed quality feedback reports and addressed challenges (Arms 1 and 2) Emailed quarterly reports of SBIRT rates to each clinic (Arms 1 and 2)	x								
	Provided in-person technical assistance and facilitation (Arms 1 and 2)		x							
	Provided one (2-hour) initial training and one (30-minute) booster training (Arms 1 and 2) Posted educational videos on intranet site (Arms 1 and 2) Provided one (1-hour) training for medical assistants (Arm 2) Provided an on-demand 30-minute webinar session (Arm 3)					x				
	Obtained public support from leaders (Arms 1 and 2) Directed the medical assistants to use the tool (Arm 2) Added screening questions to the electronic health record to facilitate SBIRT (Arms 1, 2, 3)									x

Article	Implementation Strategies	*Implementation Strategy Category*								
		A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**
Muench et al., 2015	Adapted the process to the workflow at each site			x						
	Designated champions at each site				x					
	Provided one (3.5-hour) training for residents and shorter training for faculty physicians and clinic staff					x				
	Created reminders in the electronic health record to alert clinicians						x			
	Received funding from the Substance Abuse and Mental Health Services Administration								x	
	Created documentation flow sheets in the electronic health record									x
Rieck-mann et al., 2018	Identified champions				x					
	Developed the workforce					x				
	Selected screening and brief intervention as incentive metrics Aligned incentives								x	
	Redesigned workflow									x
Salva-laggio et al., 2015	Completed a baseline needs assessment	x								
	Used a web platform to centralize materials Provided implementation support		x							
	Toured other sites Identified champions				x					
	Provided one (2-3 hour) workshop Distributed educational materials Provided online modules and links to resources					x				
	Provided tools to remind clinicians of SBIRT and available resources						x			
	Partnered with community members with lived experiences, who discussed scenarios and answered questions during workshops							x		
Sharifi et al., 2014	Completed a baseline needs assessment	x								
	Provided one (15-minute) training session					x				
	Embedded a reminder and decision support tool in electronic medical record Simplified the education and referral process						x			

Article	Implementation Strategies	*Implementation Strategy Category*								
		A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**
Sterling et al., 2015	Provided feedback on rates of screening and referral each quarter and reviewed protocol and skills to promote use of SBIRT (Arms 1, 2)	x								
	Provided technical assistance and clinical consultation (Arms 1, 2)		x							
	Provided three (60-minute) training sessions (Arm 1) Provided one (60-minute) training session (Arm 2)					x				
	Shifted tasks of brief intervention and referral to treatment to the behavioral health care practitioner when indicated (Arm 2)						x			
	Informed pediatricians of tools in the electronic medical records (Arms 1, 2, 3)									
	Reminded pediatricians to document clinical activities (Arms 1, 2, 3)									
Thomas et al., 2016	Presented data monthly	x								
	Tailored implementation strategies based on identified barriers			x						
	Assembled an interdisciplinary SBIRT committee that met monthly Identified an SBIRT champion				x					
	Provided brief in-service training meetings					x				
	Designated SBIRT health education specialist to screen all patients and contact trauma resident daily						x			
	Received funding from the Substance Abuse and Mental Health Services Administration								x	
	Integrated an order for an SBIRT consult into the trauma order set									x
Whitty et al., 2015	Adapted the implementation approach and training materials to the local setting and Indigenous population			x						
	Developed resources in collaboration with consultants and other experts				x					
	Developed best practice pathway and other resources Provided six (1-hour) workshops					x				
	Collaborated with an Indigenous reference group to develop the resources							x		

Article	Implementation Strategies	*Implementation Strategy Category*								
		A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**
Zimmer-mann et al., 2018	Reported status updates at monthly meetings	x								
	Assembled a multidisciplinary team and developed a process for SBIRT				x					
	Provided one (4-hour) training for social workers Provided an in-service to all key staff					x				
	Disseminated a list of eligible patients daily and kept this list in a project binder						x			

A= Use evaluative and iterative strategies
B= Provide interactive assistance
C= Adapt and tailor to context
D= Develop stakeholder interrelationships
E= Train and educate stakeholders
F= Support clinicians
G= Engage consumers
H= Utilize financial strategies
I= Change infrastructure

CHAPTER 3

Background

Substance use disorders (SUD) are prevalent and are associated with a variety of negative health outcomes and high financial cost for society. Worldwide, 18.5 million people have alcohol use disorder, 35 million people have a drug use disorder, and 1.1 billion people smoke tobacco (United Nations, 2019; World Health Organization, 2018; World Health Organization, 2020). Misuse of alcohol and other drugs is associated with disorganized thinking, memory loss, mental health problems, cardiomyopathy, hypertension, liver disease, pancreatitis, kidney disease, infectious disease, and cancer (National Institute on Alcohol Abuse and Alcoholism, n.d.; National Institute on Drug Abuse, 2017). Each year, more than 10 million people worldwide die due to tobacco, alcohol, or drug use (GBD 2017 Risk Factor Collaborators, 2018). Moreover, substance use is also associated with fetal alcohol syndrome, neonatal abstinence syndrome, intimate partner violence, and crime (U.S. Department of Health and Human Services, 2016). The direct and indirect costs of substance abuse are estimated to be $740 billion annually in the United States (National Institute on Drug Abuse, 2020).

Due to the serious consequences associated with substance use, healthcare providers should assess for misuse of alcohol and other drugs by patients and intervene when appropriate. Providers can be aided in this process by using Screening, Brief Intervention, and Referral to Treatment (SBIRT). According to the Substance Abuse and Mental Health Services Administration (SAMHSA), SBIRT is “an evidence-based practice used to identify, reduce, and prevent problematic use, abuse, and dependence on alcohol and illicit drugs” (SAMHSA, n.d.). SBIRT can be administered by healthcare

providers in a variety of settings (Aldridge et al., 2017; SAMHSA, 2017) and includes three components. First, the provider uses a validated tool (e.g., Alcohol Use Disorders Identification Test, Drug Abuse Screening Test) to screen patients for risky substance use. Next, based on the results of the screening and clinical judgment, the provider may provide a brief intervention (e.g., motivational interviewing) to address substance use. Lastly, providers refer individuals to treatment when appropriate.

SBIRT can be particularly useful in acute care settings. Approximately 1 out of every 7 hospitalized patients have a SUD in the United States (Center for Health Information and Analysis, 2016). Nurses, the largest sector of healthcare providers in hospitals (U.S. Bureau of Labor Statistics, 2015), are well-positioned to use SBIRT. Nurses routinely assess patients and use validated screening tools to identify patients who may need interventions. In addition, nurses are trained in therapeutic communication and are thus poised to learn techniques such as motivational interviewing. Nurses also regularly collaborate with members of the interdisciplinary healthcare team and thus can help facilitate and coordinate referrals to treatment. Moreover, patients report feeling comfortable discussing substance use with nurses (Broyles, Rosenberger, et al., 2012).

Although SBIRT is an evidence-based intervention, it is underutilized in healthcare settings. Research indicates that healthcare providers do not consistently use a validated tool to screen for substance use, and the majority of patients who use substances do not receive optimal treatment (Agley et al., 2018; SAMHSA, 2019). More information is therefore needed on the implementation of SBIRT. Implementation is defined as "active and planned efforts to mainstream an innovation within an organization" (Greenhalgh et al., 2004, p. 582). The process of implementation includes

adoption (the decision to use the intervention) and sustainment (continued use of the intervention) (Aarons et al., 2011; Greenhalgh et al., 2010; Wisdom et al., 2014;). Studies evaluating the implementation of SBIRT in various settings have been conducted (e.g., O'Grady et al., 2019; Rahm et al., 2015), but evidence regarding implementation of SBIRT by nurses in acute care settings is limited. The purpose of this study is to describe the implementation of SBIRT by direct care nurses employed on an acute care nursing unit that is in the process of implementing SBIRT.

Methods

Design

A qualitative descriptive design was used for this study. Based on textual data provided by participants, this approach is used to provide a straightforward account of a phenomenon in everyday language (Sandeloski, 2000; Sandelowski, 2010). In health services research, qualitative description can be used to obtain the perspectives of a variety of stakeholders about a system change (Chafe, 2017; Neergard et al., 2009). In qualitative descriptive research, purposive sampling is often used to identify participants who can provide the most useful information (Sandelowski, 2000). Participant accounts are obtained through semi-structured interviews, direct observation, or examination of documents (Sandelowski, 2000; Sandelowski, 2010). Data often are analyzed using qualitative content analysis, and participants' own words are often used to describe events (Sandelowski, 2000; Sandelowski, 2010). A low level of interpretation is used so that the findings remain close to participant accounts. The product of qualitative description is a comprehensive summary of the phenomenon of interest that answers a specific practice or policy question (Sandelowski, 2000). As the purpose of this study to

describe in a straightforward manner the everyday experiences of the implementation of SBIRT by nurses providing direct care, relying heavily on their own words, qualitative description was determined to be the most appropriate method.

Setting and Sample

Parent Study

This qualitative study supplements a cluster randomized implementation study examining the implementation of SBIRT at fourteen hospitals in a healthcare system in the Midwest region of the United States (referred to as the parent study). The hospitals were stratified by facility type and then randomized into an intervention group or a usual care wait-list control group (Newhouse et al., 2018). The chief nursing officer at each facility selected one medical-surgical nursing unit to participate in the parent study and one site coordinator to lead efforts at each facility. The site coordinators in the parent study received training and ongoing support to implement SBIRT (Newhouse et al., 2018). All of the hospitals in the intervention group began training in January 2018 and started using SBIRT between April and July 2018. After implementation of SBIRT, there were significant improvements in the percentage of patients screened with a validated tool and the percentage of patients who received a brief intervention.

Current Study

The study reported here (referred to as the current study) supplemented the parent study. The chief nursing officers at all seven hospitals in the intervention group of the parent study were invited to participate in the current study, and six chief nursing officers agreed. The participating institutions included 3 critical access hospitals, 2 academic health centers, and 1 community hospital. The average hospital bed size was 247 beds

(range = 15 to 858), and the average nursing unit bed size was 25 (range = 15-36). Four of the hospitals were recognized by the American Nurses Credentialing Center as either a Magnet® facility or a Pathway to Excellence® organization.

Nurses who were scheduled to work at least 20 hours per week, were employed at least six months on the study unit and had been trained in either the screening or brief intervention components of SBIRT were eligible to participate. These criteria ensured that participating nurses were familiar with the implementation of SBIRT. To recruit participants by purposive sampling, investigators obtained a list of nurses who met criteria from the unit manager or SBIRT site coordinator at each facility. Eligible nurses were divided into groups according to the type of SBIRT training they had received: Screening Only or Screening/Brief Intervention. Nurses were randomly selected from each group in proportion to the numbers of nurses on each unit who had received each type of training. For example, if 75% of the nurses on a unit were trained in Screening/Brief Intervention, then 75% of nurses recruited for the current study were drawn from this group. The investigators provided a one-page flyer about the study to the nursing manager for dissemination to all nursing staff, and recruitment emails were sent to selected nurses, along with a study information sheet. If a nurse did not respond to the initial recruitment email, a second and final recruitment email was sent one week later. Recruitment continued until 4 participants from each site completed interviews or until all eligible nurses had been contacted. This recruitment technique and sample size target was to ensure representation from multiple nurses from each facility to account for variation among facilities.

Data Collection

The investigators developed a semi-structured interview guide comprised of fifteen open-ended questions (see Appendix B). The development of the guide was informed by the theoretical domain framework (Michie et al., 2005) that identifies several domains (e.g., knowledge, beliefs, context, influences) that explain behavior change in the implementation of evidence-based interventions. The interview guide started with introductory questions about familiarity with SBIRT and initial exposure to SBIRT implementation, followed by questions about the decision to use SBIRT (adoption), efforts to mainstream SBIRT into practice (implementation), and continued use of SBIRT (sustainment). Sample questions were as follows: (a) What did you think about SBIRT when you first heard about it?, (b) How do you decide if to use/not use SBIRT when you admit a patient?, (c) Tell me about a time you used SBIRT and if it went well/did not go well?, and (d) Do you intend to continue to use SBIRT in your practice?. A qualitative expert provided feedback on the primary investigator's interview technique after a practice interview with a graduate nursing student and the first two transcripts were completed.

The investigator conducted one-to-one phone interviews with participants using the semi-structured guide and employed additional follow-up questions as needed to fully understand each participant's perspective. The participants were asked to be at a private location during the phone interviews. Most participants completed the interview at home. In a few instances, family members were present in the home at the time of the interview, but this did not distract from the conversation. Interviews were audio-recorded and professionally transcribed. The interviewer recorded field notes in Microsoft Word at the

completion of each interview. All interviews were conducted between January 2019 and June 2019.

Although the interviewer was employed within this healthcare system at one time, she had not had prior contact with any of the participants. The interviewer's credentials and status as a PhD student were included in the recruitment emails and study flyer.

Data Analysis

Data were analyzed using conventional qualitative content analysis and inductive category development (Hsieh & Shannon, 2005). Data analysis was an iterative process and began after the first interview. First, the investigator compared each audio recording with the transcripts to check for accuracy and read each transcript multiple times to understand the participants' experiences with SBIRT holistically. Next, the investigator extracted text units from each transcript. Text units are words, phrases, or sentences that capture a single coherent point made by the participants. Each text unit was assigned a code (a short phrase) to capture the essence of the text unit (Saldaña, 2015).

All codes were placed into a table organized into cells created by placing the participants' identification number on the vertical axis and the interview questions on the horizontal axis (e.g., Participant 001 X initial thoughts about SBIRT). All codes in each column were reviewed and condensed into categories by the primary investigator and reviewed by a qualitative expert (Miles et al., 2014). Then, the categories were finalized, labeled, and described. All analytic activities were facilitated with the use of Microsoft Word software. Because the transcripts were verified for accuracy by the investigator and a low interpretive analysis was used, study participants were not asked to verify the accuracy of the transcripts or provide feedback on the findings (Morse, 2015).

Ethical Considerations

Indiana University Institutional Review Board approval was obtained from the research team's institution (#1809264693), and administrative approval was obtained from each participating hospital. Prior to interviews, the investigator reviewed the study information sheet and answered all questions about participation in the study. Each participant verbally agreed to participate in the study.

Results

Seventy-one nurses were invited to participate in the study, 21 agreed to participate, and 18 met eligibility criteria and were interviewed. The majority of participants were women, worked the day shift, had a bachelor's degree, and had been trained in both the screening and brief intervention (see Table 3-1). The average length of the interviews was 21.1 minutes (range = 8 to 36 minutes). After the completion of 18 interviews, the investigators concluded that the interviews had yielded sufficiently rich information to address the study aims.

The participants described how they implemented SBIRT primarily by discussing factors that got in the way of their use of SBIRT or that helped them use SBIRT. The findings best took the form of a listing and description of barriers to and facilitators of the implementation of SBIRT from the perspectives of direct care nurses charged with using SBIRT in their day-to-day practices. Additionally, the barriers and facilitators were divided into three domains: (a) nurses' attitudes and beliefs about SBIRT, (b) organizational factors related to implementing SBIRT, and (c) patients' responses to SBIRT. The barriers and facilitators are listed in Table 3-2 and described below.

Barriers to Implementation of SBIRT

When discussing their experiences with SBIRT, the participants discussed a number of factors that interfered with their day-to-day use of SBIRT and factors that made it arduous or bothersome for them. These factors were related to their own attitudes and beliefs about SBIRT, factors in their organization that influenced the implementation of SBIRT, and patients' responses to SBIRT.

Nurses' Attitudes and Beliefs about SBIRT

The participants expressed seven attitudes or beliefs that suggested they were critical or skeptical about the use of SBIRT. First, upon initial exposure to SBIRT, several participants felt that SBIRT was just "one more thing" to do. Because they were already required to get a good deal of information when admitting patients, SBIRT only added to this process. One participant said that her initial impression of SBIRT was that it was "one more thing we have to do at the admission, which is already pretty lengthy." Other participants expressed being very busy generally and stressed that any new responsibilities, such as SBIRT, added to their workload burden. Second, some participants were troubled that nurses and other healthcare providers cannot observe the long-term outcomes of SBIRT and thus were uncertain if SBIRT "makes a difference" for patients. Some participants were doubtful that patients would follow through with referrals they had been given. One stated, "And if they did a referral, if they needed a referral, what happened after these four walls? What happened afterwards? … So, what impact can we have outside of these four walls? I don't know how you'd measure that." Third, some participants noted it is uncomfortable to ask patients about substance use and challenging not to seem judgmental. These participants were concerned SBIRT puts

patients "on the spot." Participants were especially reluctant to ask about substance use if they felt that it might harm their relationship with a patient and impede their ability to care for the acute needs of the patient. One participant stated,

> You know what really bothered me, was that this is their first impression of me… I'm going to take care of you, I'm trying to build a trusting relationship, and I'm asking you these questions. It was just really uncomfortable because that's their first impression of me and my unit was asking those questions and them thinking the judgments that they think and their perception. It was very uncomfortable.

Fourth, some participants suggested that SBIRT, especially the motivational interviewing component, was not a nursing function but rather would be more appropriately provided by social workers. The participants further suggested that social workers are better situated to provide the intervention because they could follow-up with patients whereas patients could have a different nurse every day. For example, one participant stated,

> I do think it [brief intervention] would tend to work better with somebody who is going to see them [the patient] consistently throughout the stay, like social workers…the same thing coming from the same person two or three days is a lot different than the person who just started your IV [intravenous catheter].

Fifth, a few participants, while they saw the value of SBIRT to screen for acute problems like withdrawal in the hospital, argued that an acute care unit is not the best setting to address a chronic problem with substance use. When asked if she would continue to use SBIRT, one participant replied,

> Just to keep my patients safe in the hospital? Yes. I want them to go home and not use alcohol, but that requires outpatient therapy. But to keep our patients safe while in the hospital? Yes, I'll continue to screen them.

Sixth, a few participants felt that SBIRT was unnecessary because healthcare providers are often already aware of the patients' histories with substance abuse, especially if they

are frequently admitted. For example, the participants argued that if an admitting physician or emergency department provider already asked about substance use, nurses' use of SBIRT would not provide new information. One participant said, "Usually when a patient comes in [who] is intoxicated or has a drug problem, a lot of times you already know because they tell the ER [emergency room]." Seventh, a few participants felt they did not have the knowledge or skills to intervene if the patient screened positive on the screening tool. These participants wanted to help patients address their substance use but felt unprepared to provide the intervention or referral. For example, one participant stated, "I feel like okay, well today we opened the wound, but we didn't do anything. So, it's frustrating at times. I'm doing it [screening], but I don't know why, because I've got no intervention for you."

Organizational Factors

Participants identified six organizational factors that they viewed as barriers to the use of SBIRT. First, some participants mentioned that is difficult to maintain competency in the brief intervention because they rarely had the opportunity to use it. One pointed out that if a nurse works three shifts a week and only admits a few patients each week, it's possible to go several weeks without admitting a patient who requires a brief intervention. One stated that motivational interviewing is

> a muscle you have to work though, and that's the main problem with SBIRT. It's so rare that we run across anybody who would need an intervention, any kind of intervention for substance use. It's a use it or lose it skill, you know?

Second, some participants worried that no one assessed how they were implementing SBIRT or provided feedback. As one participant stated, "There was no follow-up … or

any data that we can see how well we were doing. There was no feedback … no follow-up … no, 'Hey, you did this, you should have done this.'"

Third, a few participants noted that SBIRT was not integrated into the electronic medical record and therefore more difficult to incorporate into their workflow. One participant said, "We don't have this included as part of our admissions in Cerner [Cerner PowerChart®, the electronic medical record used at this facility]. I think a lot of time it's just an honest 'I forgot to do that kind of thing.'" Fourth, a few participants identified inadequate training as a barrier to SBIRT implementation. One participant stated, "Shift coordinators and charge nurses went and had a presentation regarding [SBIRT]. It wasn't well-structured though. It seemed like it was vague…the people giving the presentation had some type of questions themselves and couldn't answer the questions we had." Fifth, a few participants cited competing priorities as a barrier to the use of SBIRT. When admitting a patient and caring for acute problems, addressing substance use was not a top priority. For example, one participant stated, "In an admission, you're focused on getting all the details right about their home meds…going through orders, making sure all the ducks are in a row for this person…I hate to say it, but [SBIRT], it's a lesser priority." Sixth, a few participants stated that lack of adequate resources in the community was a barrier to the use of SBIRT. For example, some communities do not have adequate treatment centers or enough programs to refer patients. One participant stated that her community "lacks rehab support for patients. I mean you can't conquer the opioid and meth addiction without that support environment outside of the hospital."

Patients' Responses

Participants identified five barriers related to patients' responses to SBIRT. First, some participants felt that patients hide substance use. These participants noted that patients may be reluctant to admit to substance use or the severity of the problem, and this limits the nurse's ability to address substance use. One participant stated, "There's no incentive for them to tell the truth and make themselves look worse…You're starting out with information that may or may not be accurate." Second, some participants noted that patients might not be ready to change their behavior even if they chose to disclose their substance use. One participant stated,

> I just don't feel like they're open at that time to change, because people like to drink alcohol. That's their mindset, and if they don't want to change it, then I'm not going to influence them in the two days they're in the hospital.

Third, a few participants stated that patients are reluctant to open up about substance use until a trusting nurse/patient relationship has been established. For example, one participant said "They first don't want to trust you. They try to manipulate, and then you realize they're like 'I'm here for your best interests, I want to make you better. I want to help you, see you succeed.'" Fourth, a few participants felt that patients were angry that nurses were asking about substance use or that patients felt judged. One participant stated that "Smoking and drinking alcohol, those are legal activities for adults to do, so usually people are pretty honest…but I feel like the drug question, you're going to get people that get angry." Fifth, a few nurses identified that SBIRT was more difficult to complete when patients were tired or in pain, and yet if the nurses delayed SBIRT until the patient was ready, it might not be completed. This was especially likely if patients were admitted on night shift or had uncontrolled pain. For example, a night shift nurse stated, "At night, a

lot of times folks just want to get it over with and go to sleep, so it might not be the best time to say, 'Let's have a talk about your bad habits.'"

Facilitators to the Implementation of SBIRT

The participants also discussed a number of factors that encouraged their use of SBIRT in their day-to-day practices or contributed to their plans to continue to use it in the future. The facilitators included their own positive attitudes and beliefs, knowledge, and skills related to SBIRT; factors in their organization that promoted the use of SBIRT; and patients' constructive responses to SBIRT.

Nurses' Attitudes, Beliefs, Skills, and Knowledge Related to SBIRT

Participants expressed nine factors that facilitated the use of SBIRT in their practice based on their own responses to SBIRT. First, most participants indicated SBIRT was embraced by nurses who were comfortable asking sensitive questions and could ask open-ended questions in a conversational and non-judgmental tone. One participant stated,

> You have to be able to be a good communicator, and you have to not be judgmental of their [patients'] situation…ask the questions in a nice tone… Just show some concern, because obviously we're concerned about them, but you want them to feel you're concerned about it [substance use], and not just another question, a ho-hum thing.

Second, most participants already felt confident identifying problems with substance use and intervening to help patients, so SBIRT was an extension of these skills. These participants noted that SBIRT could reveal substance use that may not be identified by just asking patients how much they drank alcohol or used drugs. One participant stated

> We deal with most of that type of population all the time anyway, so it's kind of like why do we have to specifically ask these questions? But after starting to use it, you're actually kind of shocked by the amount of people that could actually use some, I guess, reference or direction. Some people

> you're like, 'Oh, maybe this could be something that we could help you with that is not completely related to your acute problem.'

Third, several participants felt that SBIRT could point to the need for acute interventions such as ordering a nicotine patch or monitoring to prevent withdrawal during hospitalization. Several nurses credited SBIRT with alerting them to patients' risks for withdrawal, and, in fact, some told patients that that was the purpose of the screening. One participant said,

> It's a good screening tool to help me prevent major withdrawal symptoms in the hospital. So in my mind, SBIRT is good for me to prevent the patient from going through withdrawal… so I can help them prevent their withdrawal symptoms. So I can see it coming.

Fourth, several participants felt that SBIRT expanded the nursing role while identifying problems amenable to nursing care. One participant stated, "I think that's just part of our role, to be proactive in helping to identify a problem and help get them the right information." Another participant had not heard of SBIRT prior to participating in the parent study, but when asked if she would continue to use SBIRT in her nursing practice, she said,

> I honestly think, personally for me, I would be remiss in my duties as a nurse if I didn't do that [screening and brief intervention] because it is so simple…it doesn't even take two minutes to have that conversation, two minutes. If we can't give two minutes with a patient to have that conversation and provide the knowledge, then I honestly think I would be remiss in my duties as a nurse.

Fifth, some of the participants found SBIRT to be a useful tool that could "plant the seed" for change. These participants felt that even if patients did not immediately decide to change their behavior, SBIRT could lay the groundwork for addressing their substance use. One participant stated,

> I felt like I planted a seed in someone…I asked some of those questions about 'have you harmed your family'…and he had to answer that he had. The look on his face when that question was asked, I feel like that's where the seed was planted.

Sixth, some participants noted that SBIRT made conversations about substance use easier for them as the screening tool provided ready-made ways of asking about substance use in non-judgmental and consistent ways and could be presented as part of a routine assessment. One participant stated, "It's made me calmer and easier about asking those questions. Just like your date of birth and all these other questions you have to ask, it's just made it easier … to ask those particular questions for any patient." Seventh, some participants mentioned that the use of SBIRT is facilitated if nurses already have knowledge about addiction, stages of change, how to complete the brief intervention, and available resources in the hospital and in the community.

Eighth, a few participants appreciated that SBIRT included providing information about resources after hospitalization, such as social services or Alcoholics Anonymous, to patients. One participant revealed that nurses at her facility had compiled a list of community resources that she referred to as the "SBIRT files." The participant said,

> I had a patient who had significant problems with meth, and I don't think she realized we actually have programs available in the community…I happened to be aware of other services in the community, so I provided her with the information about methamphetamine abuse that we provide through the SBIRT files.

Ninth, a few participants noted that the SBIRT screening questions were easy to ask and did not take long to complete. One participant stated, "The form is really nice, easy to use, and it can be quick…it's very easy to use."

Organizational Factors

Participants mentioned six organizational factors that facilitated the implementation of SBIRT. First, most participants noted that SBIRT was easier to use in their practices if it was incorporated into an established routine on their unit such as the standard admission process. SBIRT was more likely to be completed if the screening tool was automatically added to the admission packet or checklist. As one participant stated,

> I just tried to integrate it as part of my admission. I just got in the habit of asking those questions with part of my admission spiel, and I actually made an admission checklist for my unit… a sheet that makes it nice and easy for the nurses, especially the newer ones to go okay, these are the things I need to focus on.

Second, several participants noted their use of SBIRT had become a routine practice because it was expected for all nurses on their unit. One participant, when asked how she decides if she is going to use SBIRT, stated that she does not "consciously" make a decision about it. She said, "We do it with everyone now." Third, several participants stated that SBIRT is easier to use if there is a clear and streamlined process on their unit that includes clear expectations about who completes it, a consistent place where required forms are kept, and easily available resources such as patient education materials and a list of patient resources. One participant who was only trained in screening stated, "The nurse that does the usual screening has to ask, 'Do you use alcohol.' If that's a yes, then you mark it and pass it to the charge nurse." Fourth, some of the participants noted that good initial training and ongoing support and coaching facilitated the implementation of SBIRT. For example, one participant recommended that future sites that implement SBIRT should provide

> good education to the people who are using it…like through a communications class or role-playing, or a demonstration. Just something that you can follow up with the people who are using it. Have them give you a situation where it worked or it didn't work, and what they can do to improve it.

Fifth, some of the participants stated that an enthusiastic "champion" was essential for the implementation of SBIRT. The site coordinators in the parent study served as SBIRT champions. They led implementation efforts, provided initial training, developed implementation procedures, and adapted the intervention when needed. When discussing the site coordinator, one participant stated,

> She has been very, very passionate about this, and she has put on a lot of in-services…on how to use the tool. And she also gave us these cards, so if you have it right here there and think 'Okay, well now I need to do a brief intervention and now I need to talk to the doctor.' Let's get a plan in progress.

Sixth, a few participants mentioned that the ability to adapt the intervention to the needs of their unit facilitated the use of SBIRT. Although the core components of SBIRT needed to remain the same, nurses at each facility could adjust the way that SBIRT was incorporated into practice at their facility. For example, nurses at some hospitals created checklists or a process to facilitate hand-off or designated specific nurses to complete the brief intervention. A participant stated, "I think the [screening] form changed from the initial one to the one that we use now…the initial one that we used was a little bit more complicated."

Patients' Responses

Participants noted three patient responses to SBIRT that facilitated its use in practice. First, several participants stated that SBIRT works because patients are typically honest about substance use. One participant stated, "Most of the time people seem to be

very honest and forthcoming about how much they either drink or use drugs. I've been kind of surprised a couple times." Second, some participants noted that SBIRT works better once a relationship has been established between the patient and nurse. One participant, who works on a unit with a patient population that often has a history of intravenous drug use and long hospitalizations, stated,

> We have patients that are there [on the unit] for a long time and they start trusting you. And then you're going to have to start asking these questions, and it's amazing the stuff that they tell you, since they've been there for a week and met you four out of those seven days…what they are willing to share then…social work issues that need to be addressed, that you wouldn't have expected that you needed to do. But now you're like okay, now it's coming together, and you get the full picture.

Third, some participants stated SBIRT is most successful when patients are willing to change their behaviors regarding substance use and accept available resources and take advantage of them. One participated stated, "You feel like it goes well when you have a patient that's ready for a change, and you can kind of match them with the resources that they need." Another participant, who worked on a unit that offered group therapy, described a patient who

> Started going to group, loved it. Her whole attitude changed once she gained knowledge of why she was an addict and what she was doing to herself. It gave her those skills that she needed to be able to fight the addiction.

Discussion

SUDs are prevalent in the United States and even more prevalent for people who are hospitalized in acute care units. As nurses aim to provide holistic care to patients, it is incumbent to provide evidence-based interventions, such as SBIRT, to screen for and treat SUDs. While SBIRT has been implemented successfully in primary care and emergency departments, its implementation in acute care settings is less established. This

qualitative descriptive study was conducted to understand implementation of SBIRT by acute care nurses.

Participants identified several factors that hindered or enabled the implementation of SBIRT in their practices. Some of the barriers and facilitators to implementation of SBIRT revealed in our study are comparable to those found in other studies. In one of the first studies about implementation of SBIRT, for example, healthcare providers working in an emergency department identified several barriers to SBIRT that were also identified in our study. These barriers included a lack of time and referral resources, a lack of role models, potential resistance from patients, and a lack of belief in the effectiveness of SBIRT (Bernstein et al., 2007). In a study of the implementation of SBIRT in primary care, Hargraves et al. (2017) identified best practices for implementation, and these practices resonate with the results of our study. The best practices included having a practice champion, implementing SBIRT by an interprofessional team, clearly detailing the steps of SBIRT, offering ongoing training, aligning SBIRT with office flow, and integrating SBIRT into the electronic health record (Hargraves et al., 2017).

Broyles, Rodriguez, et al. (2012) identified several barriers and facilitators anticipated by nurses who were planning to implement SBIRT in an acute care setting. First, Broyles, Rodriguez, et al. (2012) participants specified that SBIRT can be used to determine the risk of withdrawal. Our findings are consistent, indicating that SBIRT can be used to predict, plan for, and treat withdrawal symptoms in acute care settings. Second, the participants in both our study and the Broyles, Rodriguez, et al. study (2012) cited issues of trust related to the implementation of SBIRT. Some participants believe patients are most likely to disclose substance use after developing a trusting relationship

and that asking about substance use early on in an acute care setting can be an impediment to developing such trust.

While many of the study findings resonate with those of prior studies, several findings have not been given much prior consideration in the literature. The first is confusion about whether SBIRT is a nursing function. Some participants noted that social workers are better prepared to deliver a brief intervention. Another barrier not addressed previously is the logistics and timing of SBIRT. Nurses have difficulty conducting SBIRT when patients are admitted overnight or in acute distress. The participants also mentioned several facilitators not extensively addressed in the literature. While participants noted that nurses who provide SBIRT in acute care settings will not see the long-term outcomes for patients, some felt that it was still worthwhile to provide SBIRT and "plant the seed" for change during hospitalization. Another finding of the study that adds to the literature was that the implementation of SBIRT was facilitated when it was incorporated into a routine process in a user-friendly workflow.

Strengths and Limitations

There are several strengths and limitations to this study. The qualitative descriptive design yielded a robust list and description of barriers and facilitators to implementing SBIRT as identified by direct care nurses in day-to-day practice. Because the findings rely heavily on the participants' accounts of implementing SBIRT, the results can be used to develop strategies to improve the implementation of SBIRT on acute care units. Another strength is that the participants worked in six different acute care hospitals and represented a variety of ages, years of nursing experience, and shifts worked. One study limitation, however, is the potential for selection bias. The nursing

units that participated in the parent study (and therefore in the current study) were selected by chief nursing officers and thus might represent units with higher capacity or inclination for change. In addition, only 25% of nurses who were contacted by the investigator agreed to participate in the current study. Nurses who refused participation may have been those who were less invested in SBIRT or those who might have been reluctant to discuss dissatisfactions with SBIRT despite the promise of confidentiality. Future research studies should implement SBIRT on all acute care units in a variety of facilities and obtain higher participation of direct care nurses in order to determine how varying unit and facility cultures related to substance use treatment and individual nurses' attitudes effect the use of SBIRT. Quantitative studies could then be aimed at measuring influencing factors and determining which ones are most associated with the successful implementation of SBIRT on acute care units.

Implications

Despite limitations, several practice implications can be drawn from the study findings. The list of barriers and facilitators can inform decisions about how to implement SBIRT on acute care units. Specifically, the findings have implications related to addressing nurses' attitudes and beliefs that hamper the implementation of SBIRT, addressing organizational factors that might impede the implementation of SBIRT, and understanding addiction and developing strategies to decrease patients' resistance to assessment and treatment of substance use.

Nurses concerns about SBIRT might be ascertained and addressed during initial training and then periodically through ongoing supervision by SBIRT champions. For example, the concern that acute care nurses will not observe the long-term outcomes of

SBIRT could be offset with a discussion of the notion of the importance of "planting the seed." Similarly, nurses' focus on SBIRT as a tool for only assessing risk for withdrawal during hospitalization could prompt a discussion of the broader goals of SBIRT as an intervention to address substance use as a chronic health problem. To counteract nurses' apprehensions that they are not best positioned to deliver SBIRT, champions can emphasize how nurses possess the basic communication and collaboration skills needed to implement the three components of SBIRT, and how more specialized skills, such as motivational interviewing or awareness of community resources available for referral, will be addressed in training.

The findings related to organizational factors that hinder or help acute care nurses' use of SBIRT have implications for administrators charged with implementing SBIRT. The findings indicate that SBIRT training needs to be conducted by instructors highly experienced in SBIRT and that ongoing support, feedback, and supervision, including opportunities to refresh skills, is important. Because the results clearly reveal that nurses struggle with competing priorities and demands, their suggestions that SBIRT be integrated in the electronic medical record and be incorporated into their normal workflow should be considered when SBIRT is implemented on an acute care unit. Additionally, although the core components of SBIRT should remain the same, our findings indicate the benefit of adapting the implementation of SBIRT to fit the context of the organization.

The findings regarding how patient factors influence the nurses' use of SBIRT also has implications for practice. Nurses should be provided education about addiction, which addresses why patients might not be truthful about their substance use, may not be

ready to disclose it, or might become angry if asked about substance use. SBIRT training and supervision can stress that these responses can be typical responses to addiction and do not preclude the use of SBIRT. SBIRT training should provide a variety of strategies to best address these responses. Moreover, our findings suggest that patient factors should drive when SBIRT is administered as it will not be effective when patients are in acute distress.

Conclusion

To provide holistic care to people admitted to acute care hospitals, the implementation of SBIRT, an evidence-based intervention for SUD, should be considered a best practice. This qualitative descriptive study included interviews with 18 direct care nurses who were expected to use SBIRT in their routine daily practices. Several barriers and facilitators that influenced their use of SBIRT were identified and described. The barriers and facilitators occurred in three domains: nurses' attitudes, beliefs, and skills; organizational factors, and patient responses. The findings can be used to guide SBRIT champions and facility administrators in improving the adoption, implementation, and sustainment of SBIRT on acute care nursing units.

Table 3-1
Participant Characteristics

	Mean (Standard Deviation)	**Range**
Age in years	43.94 (11.56)	25-63
Years of registered nurse experience	15.61 (9.41)	3-37
Years of experience on current unit	8.94 (8.23)	1-32
	n	**%**
Sex		
Female	17	94.44
Male	1	5.56
Shift		
Day	13	72.22
Night	5	27.78
Highest nursing degree		
Associate's	5	27.78
Bachelor's	12	66.67
Master's	1	5.56
Doctoral	0	0
Training		
Screening only	4	22.22
Screening and brief intervention	14	77.78
Type of facility of employment		
Academic health center	5	27.78
Community hospital	4	22.22
Critical access hospital	9	50.00

Table 3-2
Barriers and Facilitators to Implementation of SBIRT

	Barriers	**Facilitators**
Nurse's attitudes and beliefs about SBIRT	1. SBIRT one more thing to do 2. SBIRT long-term effects not observable 3. Screening questions uncomfortable to ask 4. Brief intervention not a nursing function 5. Acute care setting not best setting to use SBIRT 6. SBIRT doesn't provide new information 7. Feel unprepared to provide intervention	1. Comfortable asking sensitive questions and communicating 2. SBIRT is an extension of current skills 3. SBIRT identifies need for acute interventions 4. SBIRT expands the nursing role 5. SBIRT is a useful tool 6. The screening tool makes it easier to ask routine questions about substance use 7. Knowledge of addiction and how to use SBIRT 8. SBIRT provides information about resources after hospitalization 9. Screening is easy and doesn't take long
Organizational factors related to SBIRT	1. Difficult to maintain competency in brief intervention 2. No assessment of SBIRT or feedback 3. SBIRT not integrated into the electronic medical record or workflow 4. Inadequate training 5. Competing priorities 6. Lack of adequate resources in the community	1. SBIRT is incorporated into routine practice 2. SBIRT is an expectation of all nurses 3. Clear and streamlined process for SBIRT 4. Good training and ongoing support 5. SBIRT champion 6. Ability to adapt SBIRT

	Barriers	Facilitators
Patients' responses to SBIRT	1. Hide substance use 2. Not ready to change behavior 3. Reluctant to open up until trusting nurse/patient relationship established 4. Feel angry or judged 5. Difficult to use SBIRT if patient is tired or in pain	1. Honest about substance use 2. More effective when trusting nurse/patient relationship has been established 3. Willing to change behavior and accept available resources

CHAPTER 4

Introduction

Despite a call to improve health by ensuring that 90% of clinical decisions are supported by the best available evidence (Institute of Medicine, 2009), healthcare providers remain far from this goal (Melnyk & Fineout-Overholt, 2019). Evidence-based practice (EBP) is the use of the best available evidence from research, clinicians, and patients to make decisions about care (Sackett et al., 1996), and EBP leads to improved patient outcomes and reduced healthcare costs (Melnyk et al., 2015). Healthcare providers generally have favorable attitudes towards EBP but report deficits in the implementation of evidence-based interventions (Arumugam et al., 2018; Verloo et al., 2017; Warren et al., 2016). When compared to physicians, nurses report similar levels of knowledge about EBP and attitudes towards EBP, but lower use of clinical research to inform decision-making (Arumugam et al., 2018). Failure to implement evidence-based interventions is especially apparent in the care of people with substance use disorders (SUD). For example, validated tools to screen patients for SUD have existed for decades, (e.g., Babor et al., 1989; Skinner, 1982), but healthcare providers rarely use these tools (Agley et al., 2018; Anderson et al., 2016; Rieckmann et al., 2018). Additionally, a comprehensive approach to prevention and treatment of substance use disorders, referred to as Screening, Brief Intervention, and Referral to Treatment (SBIRT), is underutilized by healthcare providers, and successful implementation of SBIRT has proven challenging (Anderson et al., 2016; Mello et al., 2009; Salvalaggio et al., 2015; Sharifi et al., 2014).

Effective implementation of SBIRT requires the use of multi-faceted strategies oriented towards both professionals and patients (Keurhorst et al., 2015), and a higher

intensity of intervention effort (such as more training) is associated with higher utilization of SBIRT in practice (Nilsen et al., 2006; Sterling et al., 2015). Current research on the implementation of SBIRT focuses primarily on group-level and organization-level outcomes with less understanding of the use of SBIRT by individual providers; however, the factors influencing an organizational decision to use an intervention differ from those factors influencing individual providers within the organization (Aarons, 2005; Frambach & Schillewaert, 2002).

Intra-organizational adoption, or an individual's adoption and use of an intervention adopted by an organization, is influenced by organizational factors, social networks, and personal attributes (Aarons, 2005; Frambach & Schillewaert, 2002). Even if an organization expects nurses to use an intervention, additional strategies are needed to support the successful implementation of that intervention (Lim et al., 2019; Scheidenhelm & Reitz, 2017; Sharp et al., 2019). Little is known about intra-organizational adoption of SBIRT, but identification of factors related to provider acceptance of this intervention can lead to more effective implementation. The study examines the intra-organizational adoption of SBIRT by nurses in acute care settings.

Background

The use of alcohol and other drugs is associated with significant morbidity, mortality, and societal costs worldwide (United Nations, 2019; World Health Organization, 2018), and substance use is considered a public health crisis in the United States (U.S. Department of Health and Human Services, 2017). Although substance use disorders are treated with a combination of medication, counseling, and other medical services (National Institute for Drug Abuse, 2019), healthcare providers rarely use

validated tools to screen patients for substance use (Agley et al., 2018), and nearly 90% of people with unhealthy substance use do not receive treatment at a specialty facility (Substance Abuse and Mental Health Services Administration [SAMHSA], 2019).

SBIRT is an effective intervention in the prevention, identification, and treatment of substance use disorders (Aldridge et al., 2017; SAMHSA, n.d.). Depending on the patient's needs, healthcare providers can complete SBIRT in 1 to 3 steps. First, providers use a validated tool to screen all adult patients for unhealthy substance use. Second, if indicated by screening and clinical judgment, providers deliver a brief intervention to the patient. Third, providers refer the patient to specialty treatment if indicated (SAMHSA, n.d.). The first step of SBIRT, screening with a validated tool, is the foundation of SBIRT and essential to determine the level of service required by the patient (Agley et al., 2018). Nurses indicate that using a validated tool to screen for substance use is a quick and simple method to obtain beneficial information about the patient, but providers rarely use these tools (Agley et al., 2018). The missed opportunity to address SUD and provide evidence-based care is especially pertinent in hospitalized patients, where the rate of SUD is higher than the general public (Center for Health Information and Analysis, 2019; SAMHSA, 2019).

The gap between evidence-based care and actual high-quality care is largely due to the failure to successfully implement new interventions (Nembhard et al., 2009). Implementation, or the use of active efforts to incorporate a new intervention within an organization, is a complex process that is influenced by the internal and external environment; characteristics of the organization, individuals, and intervention; and social interactions between and among individuals (Greenhalgh et al., 2004). Research indicates

that the implementation of EBP by nurses is facilitated by effective leadership (Engle et al., 2017; Kowalski et al., 2020; Shuman et al., 2018), sufficient staffing and other resources (Duncombe, 2018; Kowalski et al., 2020), and adequate training (Bremner et al., 2019; Lewis et al., 2019). Additionally, individuals may be more or less likely to adopt and implement EBP based on their perception of peer usage of the intervention (Aarons, 2005; Frambach & Schillewaert, 2002; Hasanpoor et al., 2019), attitudes about EBP (Aarons, 2005; Alqahtani et al., 2020; Mohammadi et al., 2018) and personal innovativeness or resistance to change (Mohammadi et al., 2018; Reilly et al., 2019). Personal characteristics such as age may also be related to the implementation of EBP, but this relationship is less clear (Li et al., 2019; Mohammadi et al., 2018; Paparone, 2015).

Purpose

The purpose of this cross-sectional survey study is to examine individual and organizational characteristics associated with intra-organizational adoption of an evidence-based intervention. The intervention of interest in this study is the use of validated screening tools to screen for SUD (i.e., the first step of SBIRT).

Conceptual Framework

The conceptual model for this study was informed by models of intra-organizational adoption by Frambach & Schillewaert (2002) and Aarons (2005), as well as a qualitative study of the implementation of SBIRT by acute care nurses (described in Chapter 3). In this model, a decision to adopt a new intervention is made at an organizational level, with the assumption that individuals within the organization will use the intervention. Individuals within the organization make decisions about whether they

intend to use the intervention or not based on their perception of leadership support for the implementation of EBP, the availability of resources and support within the organization to support change (i.e., organizational capacity), the acquisition of knowledge regarding the intervention (i.e., training), their perception of how often their peers use the intervention (i.e., peer usage), their evaluation of the favorability of EBP (i.e., attitudes about EBP), their readiness to adopt new innovations (i.e., personal innovativeness), and personal characteristics such as age, level of education, and years of experience. In addition to an individual's intention to use the intervention, another outcome of interest is the actual use of the intervention in practice. Since this is a preliminary study to identify the factors most closely associated with intra-organizational adoption of the screening tools, the conceptual model does not include mediating or moderating variables (see Figure 4-1)

Methods

Design, Sample, and Setting

This cross-sectional descriptive study used data from direct care nurses employed at 14 acute care hospitals within a large healthcare system in the Midwest region of the United States. The setting included 6 critical access hospitals, 4 academic health centers, and 4 community hospitals. Nurse leaders selected one medical-surgical unit at each facility to participate in a parent study of the implementation of SBIRT (Newhouse et al., 2018), and nurses employed on these units were expected to incorporate SBIRT into their practices and screen adult patients with validated screening tools (i.e., the Alcohol Use Disorders Identification Test [AUDIT] and the Drug Abuse Screening Test [DAST]) within 24 hours of admission. If a patient was disoriented or in acute distress upon

admission, nurses were not expected to use a validated tool to screen the patient unless these issues resolved throughout the hospitalization. Nurse leaders at each facility communicated the expectation to incorporate SBIRT into practice as a newly-required practice on the unit, and leaders at each facility determined how they would address non-adherence to the requirement.

As part of the parent study, the leaders at the healthcare organization, in collaboration with researchers from a local University, identified and prepared champions to lead the implementation and provided regular and ongoing implementation support. The SBIRT champions at each facility led the implementation, which included adapting the intervention and implementation plan to fit the context at each hospital (Keen et al., 2019; Newhouse et al., 2018; Schwindt et al., 2019). The parent study started in August 2017, and all participating units started using SBIRT in practice by the fall of 2018. The researchers, healthcare leaders, and SBIRT champions continued to collaborate and actively promote the use of SBIRT until June 2019. At that point, leaders at each facility determined if nurses were expected to continue to use SBIRT in practice. This cross-sectional study supplemented the parent implementation study and was reviewed and approved by the Indiana University Institutional Review Board (#190901608).

To operationalize the constructs from our conceptual model, we invited all direct care registered nurses employed on the parent study units to participate in a survey via an electronic learning management system in November 2019. This recruitment method was selected because the system is often used to present information and gather data from employees, and all nurses on the study units had experience using this system. Nurses were excluded from the final data analysis if they began working on the study unit after

completion of the parent study (June 2019 or later). Nurses were provided the opportunity to review the aims of the study, an information sheet about the study, and language regarding voluntary participation. Nurses who decided to participate in the study within a 30-day window clicked on a link to the anonymous survey. Participants could elect to submit their email address with their survey responses, and one participant from each hospital was randomly selected to receive a $50 gift card.

Measures

The survey for data collection was created in Qualtrix XM, a secure online platform for data collection. A direct care nurse, a nurse educator, and a nurse leader pilot-tested the survey, and the format of the survey was adjusted based on their feedback. The survey included the Implementation Leadership Scale (Aarons et al., 2014); the organizational capacity subscale of the Program Sustainability Assessment Tool (Luke et al., 2014); the attitudes subscale of the Evidence-Based Practice-Knowledge, Attitude, Behavior, and Outcome/Decision Scale (Shi et al., 2014); the Innovativeness Scale (Hurt et al., 1977); and individual questions regarding training, intent to use the screening tools, use of the screening tools in practice, and demographic data. Additionally, participants were asked to indicate the hospital where they were employed. All variables were self-reported and from the perspective of individual nurse respondents.

Implementation Leadership

The Implementation Leadership Scale consists of 4 subscales and includes 12 items with statements such as “Leaders on this unit have removed obstacles to the implementation of evidence-based practice” and “Leaders on this unit support employee

efforts to use evidence-based practice." Participants respond to each item using a 5-point scale from 0 ("not at all") to 4 ("very great extent"), and the final score is determined by calculating a mean score for each subscale and then calculating the mean of the subscales scores. A higher score indicates a more favorable perception of leadership, and previous studies have shown the scale to be internally consistent, with Cronbach's alpha greater than 0.90 (Aarons et al., 2014; Shuman et al., 2020). Additionally, this scale has demonstrated convergent validity with a multifactor leadership tool and discriminant validity in contrast to organizational climate (Aarons et al., 2014).

Organizational Capacity

The organizational capacity subscale of the Program Sustainability Assessment Tool includes 5 items with statements such as "Organizational systems are in place to support the various program needs" and "The program has adequate staff to complete the program's goals." Participants respond using a 7-point scale from 1 ("to little or no extent") to 7 ("to a very great extent"). Participants may also respond that a question is not applicable ("n/a- not able to answer"). The total score is calculated by adding the responses and averaging the items with a response other than "n/a- not able to answer." A higher score indicates a higher perception of organizational capacity for that program. This subscale has demonstrated internal consistentcy in a prior study, with a Cronbach's alpha of 0.87 , and a preliminary construct validity analysis demonstrated a moderate correlation between the Program Sustainability Assessment Tool overall results and perceived program sustainability (Luke et al., 2014).

Training

To determine if participants received training on the screening tools, participants responded to the yes/no question "There are validated tools (e.g., AUDIT, DAST) to screen patients for unhealthy alcohol or drug use. Were you trained to use these tools?"

Peer Usage

Using guidance from Azjen (n.d.) and Fishbein & Azjen (2010), investigators developed a question to measure peer usage of the screening tools. Because the survey was sent to participants after completion of the parent SBIRT implementation study, participants were asked to respond based on their perceptions during the study. The respondent's perception of peer usage of the tools was measured using the statement "During the SBIRT study (i.e., fall 2018 and spring 2019), most of the nurses on my unit used a validated screening tool (e.g., AUDIT or DAST) to screen adult patients for unhealthy alcohol or drug use within 24 hours of admission." Respondents answered using a 7-point scale from 1 ("strongly disagree") to 7 ("strongly agree").

Attitudes About EBP

The attitudes subscale of the Evidence-Based Practice- Knowledge, Attitude, Behavior, and Outcome/Decision Scale is a 13-item instrument that includes items with statements such as "Evidence-based practice should be an integral part of clinical practice" and "I use evidence-based practice because it improves patient outcomes." Participants respond using a 7-point scale from 1 ("strongly disagree") to 7 ("strongly agree"). The final score is calculated by reverse scoring relevant items and adding the total of all 13 questions, with higher scores indicating more favorable attitudes towards EBP. Prior studies have demonstrated that this subscale and scale have internal

consistency, with Cronbach's alpha of 0.75 for the attitudes subscale (Shi et al., 2014) and Cronbach's alpha of 0.85 for the overall scale (Shi et al., 2014).

Personal Innovativeness

The Innovativeness Scale includes items with statements such as "I am generally cautious about accepting new ideas" and "I tend to feel that the old way of living and doing things is the best way." Participants respond using a 5-point scale from 1 ("strongly disagree") to 5 ("strongly agree"). The final score is calculated by reverse scoring relevant items and adding the total of all items, with higher scores indicating a higher degree of innovativeness (Hurt et al., 1977; Measurement Instrument Database for the Social Sciences, 2013). Although the original scale includes 20 questions, a shortened 10-item scale was used for this study. The 10-item scale is highly correlated to the full 20-item scale, and a previous study demonstrated that the 10-item scale was internally consistent with Cronbach's alpha of 0.72 (Clement-O'Brien et al., 2011; Hurt et al., 1977).

Intention and Use of the Tools in Practice

Using guidance from Azjen (n.d.) and Fishbein & Azjen (2010), investigators developed items regarding intention and use of the tools in practice. Similar to the question about peer usage of the tools, the items about intention and use of the tools in practice were asked in relation to the timing of the parent study. Intent to use the tools was measured using the statement "During the SBIRT study (i.e., fall 2018 and spring 2019) when I admitted an adult patient, I intended to use a validated screening tool (e.g., AUDIT or DAST) to screen the patient for unhealthy alcohol or drug use within 24 hours of admission." Use of the tools in practice was measured using the item "During the

SBIRT study (i.e., fall 2018 and spring 2019) when I admitted an adult patient, I actually used a validated screening tool (e.g., AUDIT or DAST) to screen patients for unhealthy alcohol or drug use within 24 hours of admission." Respondents answered both items using a 7-point scale from 1 ("never") to 7 ("every time").

Demographic Data

Questions regarding ethnicity, race, and sex were asked using questions and response scales from the U.S. Department of Health and Human Services (2011). In addition, the survey included questions regarding the respondent's age, certification status, highest nursing degree, year of licensure, and the month and year of hire on his/her current unit of employment. All demographic questions were optional in the survey.

Statistical analysis

Descriptive statistics were calculated for all variables and scales, and the internal consistency of each scale was calculated using Cronbach's alpha. All missing continuous variables (i.e., age, years of experience, tenure on the unit) were replaced with the average value, and all missing categorical variables (e.g., highest nursing degree, race, sex) were replaced with the most common response for that category. Based on the distribution of responses, the variables of race and highest nursing degree were condensed into fewer categories. Responses to intention to use the screening tools and use of the screening tools in practice were dichotomized into high intention/use (responded "every time" or "usually") and not high intention/use (all other responses). This cut-off point for dichotomization was selected because the expectation was that nurses would screen all patients, with a few exceptions based on the condition of the patient. Likewise, the perception of peer usage of the screening tools was dichotomized

into high peer usage (responded “strongly agree” or “moderately agree”) and not high peer usage (all other responses).

Data in this study were reported from individual nurses working within multiple hospitals. Individuals working within the same facility may share experiences that affect their responses (leading to non-independent observations), therefore a multilevel or hierarchical model was considered for multivariate analyses (Tabachnick & Fidell, 2013). To evaluate the need to use a hierarchical model, an empty hierarchical logistic regression was completed with the dependent variable, no independent variables, and a random intercept for the hospital. The test for the random intercept was not significant ($z= 1.458$, $p= .145$), indicating that there were not significant covariances among nurses working in the same hospitals (Cho, 2003; Tabachnick & Fidell, 2013); Therefore a binary logistic regression was used to test relationships between the dependent and independent variables. A total of 115 participants reported high usage of the screening tools in practice, and 113 of these participants (98.3%) also reported high intention to use the tools in practice. Conversely, of the 107 participants who did not report high usage of the screening tools in practice, 83 of these participants (77.6%) did not report high intention to use the tools. Since intention and use in practice were closely related in this sample, and use of the tools in practice is more clinically relevant, the primary multivariate model was conducted with use of the tools as the dependent variable. The final model for analysis included all independent variables and the dependent variable of use of the screening tools in practice; This model was analyzed using logistic regression.

Several sensitivity analyses were conducted to evaluate the robustness of the results. Six additional models were evaluated, inclusive of a) a model with ‘high use’

defined as respondent answered “every time”, b) a model with ‘high use’ defined as respondents answered “frequently,” “usually,” or “every time,” c) a hierarchical model with a random intercept for hospital, d) a model in which the participants who did not provide demographic data were removed from data analysis, e) a model with ‘high intention’ as the outcome of interest, and f) a model using backwards selection. All data analysis was completed using IBM© SPSS Statistics Version 26.

Results

A total of 398 nurses were invited to participate in the study, and 279 nurses completed the survey for a response rate of 70.1%. Nurses hired after the conclusion of the parent study were excluded from the final analysis, therefore 29 nurses who started after the conclusion of the parent study and 28 nurses who did not provide a hire date were excluded.

Of the 222 participants included in the final data analysis, the average age was 37.88 (+/- 10.67) years old. The majority of participants were non-Hispanic/Latino (94.1%) and were white (86.9%), female (88.7%) had a bachelor’s degree (63.5%) and were not certified in any patient population or specialty (60.4%). Most of the participants reported receiving training on the screening tools (58.1%), and reported a high intention to use the tools (61.7%). Approximately half of the participants reported high usage of the screening tools in practice (51.8%) and a perception of high peer usage of the screening tools in practice (50.9%) (see Table 4-1). This demographic information is similar to the demographic information of all nurses within this healthcare facility.

When measuring the participants’ perceptions of implementation leadership, responses ranged from the lowest possible score (0) to the highest possible score (4), with

an average of 2.64, indicating that participants generally felt favorably about implementation leadership. Participants' perceptions of organizational capacity for change also ranged from the lowest possible score (1) to the highest possible score (7), with an average of 4.58, indicating that participants generally felt favorably about the capacity for change at their facility. When measuring attitudes towards EBP, the lowest possible score is 13. The lowest response in this study was 31, and the highest response was the highest possible response of 91, indicating an overall favorable attitude towards EBP. Participants in this study also reported varying degrees of personal innovativeness. Responses to the Innovativeness Scale can range from 10-50, and participants in this study ranged from 22 to 50, with an average of 36.36, indicating a high degree of innovativeness. All scales demonstrated estimates of Cronbach's alpha greater than 0.80 in this study (see Table 4-2).

Factors Related to the Use of the Screening Tools in Practice

The results of the logistic regression are presented in Table 4-3. The model includes all independent variables, and the outcome is use of the tools in practice, with high use defined as use of the tools "usually" or "every time" the nurse admits an adult patient. Three independent variables in this model were significantly related to actual use of the tools in practice: training, peer usage, and tenure on the unit. Training was significantly related to use of the tools, and participants who were trained to use the tools were 4.640 times more likely to report high usage of the tools in practice than participants who did not receive training (95% CI 1.937, 11.113, p=.001). Participants who reported that their peers had high usage of the tools were 45.642 times more likely to report that they themselves had high usage of the tools in practice (95% CI 17.616, 118.255,

p<.001). Each additional year of tenure on the unit was associated with 1.111 increased odds of the participant reporting high use of the tools (95% CI 1.008, 1.224, p=.034). In this model, participants with a race of "other" reported higher use of the tools in practice than participants with a race of "white."

Sensitivity Analysis

In each of the six models evaluated for the sensitivity analysis, training and peer usage were significantly related to the dependent variable. When the outcome was modified to define 'high use' as the respondent answered "every time," organizational capacity was also related to the dependent variable. In this model, each unit increase in the organizational capacity scale was associated with 1.755 increased odds of reporting high use of the tools in practice (95% CI 1.154, 2.670, p<.05) Age was also significantly related to the outcome in this model, and each additional year of age was associated with a 1.088 increased odds of reporting high use of the tools in practice (95% CI 1.023, 1.157, p<.05). When a hierarchical model was used to analyze the data, each additional year of experience on the study nursing unit was associated with a 1.111 increased odds of reporting high usage of the tools in practice (95% CI 1.003, 1.231, p<.05).

Discussion

Evidence-based care is lacking for people with SUD, and healthcare providers underutilize SBIRT, an evidence-based intervention. Although SBIRT is an effective intervention, the implementation of SBIRT is challenging. Researchers have evaluated the implementation of SBIRT at an organizational level, but less attention has been given in the literature to providers' intra-organizational adoption of SBIRT. This cross-sectional study used a surve design to examine individual and organizational

characteristics associated with their use of validated screening tools to assess for unhealthy substance use in practice.

All of the participants in this study were expected to screen their patients for unhealthy substance use upon admission, and the health system leaders and SBIRT champions used multiple strategies to support the implementation of SBIRT. Yet nearly half of the respondents indicated that they did not screen their patients as frequently as expected by the organization. While this gap between organizational adoption of SBIRT and intra-organizational adoption of the screening tools is large, it is consistent with the results of other studies of the implementation of EBP by nurses and the implementation of SBIRT by multiple healthcare providers (Egizio et al., 2019; Mertens et al., 2015; Sharp et al., 2019). Frontline leaders report that failure to create buy-in or engagement from frontline providers is a significant barrier to successful change in hospitals (Longenecker & Longenecker, 2014).

Participants in this study were more likely to use the screening tools in practice if they had received training on the use of the tools. Similar to this study, Sterling et al. (2015) found that pediatricians who attended more training sessions were more likely to screen for substance use than their peers who attended fewer training sessions. However, the relationship between training and use of the screening tools in practice is not necessarily causal. Although knowledge of an intervention is an antecedent to the adoption of the intervention (Wisdom et al., 2014), nurses indicate that the screening tools are easy to use (see Chapter 2), and all nurses have the competency to use screening tools in practice (Finnell et al., 2019). Nurses who were more interested in screening for substance use may have been more likely to attend the training sessions. Furthermore, a

lack of training may indicate that participants were not aware of the screening tools or the organizational expectation that they screen all applicable patients for substance use.

The participants' perceptions of peer usage of the screening tools were also significantly related to participant's use of the tools in practice. Nurses and other providers report that peer influence may serve as a barrier or facilitator to the implementation of EBP (Ploeg et al., 2007; Sullivan et al., 2017), and social influence is known to impact individual provider's decisions about the use of evidence-based interventions (Wisdom et al., 2014). When evaluating the implementation of SBIRT, however, researchers often measure organizational-level outcomes and do not address the role of social influence in implementation efforts (e.g., Anderson et al., 2016; Henihan et al., 2016).

Limitations

There are several limitations to this study. First, all of the participants in this study worked on units that were selected for participation in the parent study. These units may have characteristics that differ from other nursing units, and therefore the results may not be generalizable. Second, participants were asked to self-report their intentions and behaviors several months after completion of the parent study, and participants may not have been able to recall their past intentions and behaviors accurately. Third, although participation was voluntary and participants were not required to provide any identifying information, the link to the study survey was shared via a system used by the healthcare system to provide information and track data. Participants may have responded in a way that they felt would be viewed favorably by their employer. Finally, the survey included the names for the validated screening tools, but some participants may not be familiar

with the names of the tools or the phrase ‘validated screening tool’ to describe an assessment they complete in practice.

Implications

The results of this study confirm that the organizational adoption of an evidence-based intervention does not result in consistent intra-organizational adoption by nurses within that organization. Leaders implementing a new evidence-based intervention should ensure that all nurses receive training on the intervention. Additionally, because respondents’ use of the tool was closely related to their perception of peer usage of the tool, a baseline needs assessment prior to the implementation of a new intervention should include assessment of frontline nurses’ perspective of the intervention. Future research should focus on intra-organizational adoption during the active implementation process and the role of training and social influence on individual nurses’ adoption of a new intervention within an organizational context.

Conclusion

The implementation of evidence-based interventions is challenging, leading to sub-optimal care that is not grounded in the best available evidence. One barrier to effective implementation is the lack of intra-organizational adoption by nurses. This study suggests that intra-organizational adoption is most significantly related to training and nurses’ perception of their peer usage of the intervention. Leaders should consider these when planning efforts to incorporate new interventions into practice.

Figure 4-1
Conceptual Model

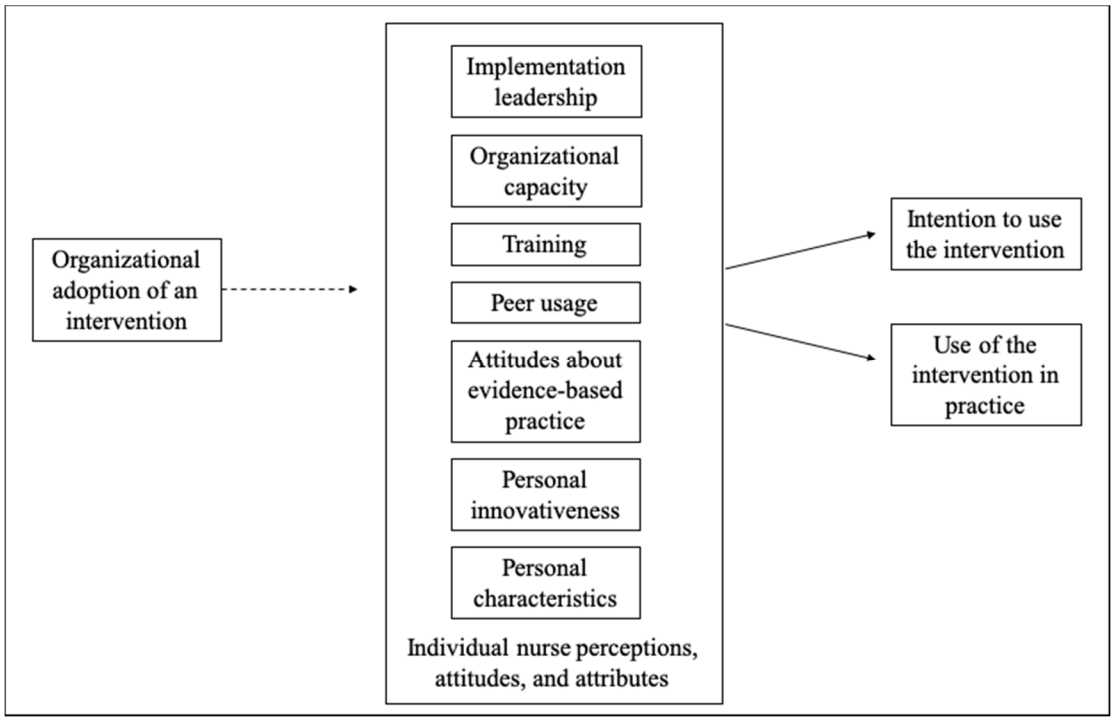

Table 4-1
Participant Characteristics

	Mean (standard deviation)	**Range**
Age in years	37.88 (10.67)	21-71
Years of RN experience	9.18 (8.45)	<1- 42
Years of experience on current unit	5.38 (5.90)	<1- 38
	n	**%**
Ethnicity		
Hispanic or Latino	8	3.6
Not Hispanic or Latino	209	94.1
Did not respond	5	2.3
Race		
White	193	86.9
Black or African American	9	4.1
American Indian or Alaska Native	2	0.9
Asian	8	3.6
Native Hawaiian or Other Pacific	0	0
Islander	10	4.5
Did not respond		
Sex		
Female	197	88.7
Male	13	5.9
Did not respond	12	5.4
Highest nursing degree		
Diploma	3	1.4
Associate's	67	30.2
Bachelor's	141	63.5
Master's	6	2.7
Doctoral	1	0.5
Did not respond	4	1.8
Certification status		
Certified	82	36.9
Not certified	134	60.4
Did not respond	6	2.7
Training		
Received	129	58.1
Did not receive	93	41.9
Perception of peer use of screening tools	113	50.9
High use	109	49.1
Not high use		

	n	%
Intention to use screening tools		
High intention	137	61.7
Not high intention	85	38.3
Actual use of screening tools		
High use	115	51.8
Not high use	107	48.2

Table 4-2
Scale Summary Statistics and Cronbach's Alpha

	Mean (standard deviation)	**Minimum**	**Maximum**	**Cronbach's alpha**
Implementation Leadership	2.64 (.84)	0	4	.974
Organizational Capacity	4.58 (1.45)	1	7	.908
EBP Attitudes	65.81 (11.70)	31	91	.870
Personal Innovativeness	36.36 (5.61)	22	50	.828

Table 4-3
Multivariate Logistic Regression Results

	Log odds	Odds Ratio (OR)	95% Confidence Interval (CI) for OR
Intercept	-2.966	.052	
Leadership	-.306	.737	.406, 1.337
Organizational capacity	.247	1.280	.909, 1.803
Receiving training			
Yes	1.535*	4.640	1.937, 11.113
(No)[1]			
EBP Attitudes	-.007	.993	.948, 1.039
Innovativeness	.006	1.006	.921, 1.099
Peer usage			
High usage	3.821**	45.642	17.616, 118.255
(Not high usage)			
Age	-.006	.994	.942, 1.050
Years of experience	-.026	.974	.914, 1.039
Years on this unit	.105*	1.111	1.008, 1.224
Highest nursing degree			
Diploma/Associate's	.235	1.265	.502, 3.188
(Bachelor's or higher)			
Certification status			
Certified	-.398	.672	.274, 1.644
(Not certified)			
Ethnicity			
Hispanic/Latino	.396	1.486	.156, 14.149
(not Hispanic/Latino)			
Race			
Black	1.453	4.278	.689, 26.576
Other	2.556*	12.885	1.568, 105.891
(White)			
Sex			
Male	-.623	.536	.092, 3.116
(Female)			

[1]Reference category in parentheses
* $p < 0.05$
** $p < 0.001$

CHAPTER 5

Introduction

The purpose of this dissertation was to contribute to the literature regarding the adoption and implementation of Screening, Brief Intervention, and Referral to Treatment (SBIRT) in healthcare settings. Chapter 2 described a scoping review of 18 studies evaluating strategies to increase the reach and adoption of SBIRT. Chapter 3 described a qualitative descriptive study of the adoption and implementation of SBIRT by nurses in acute care hospitals. Chapter 4 described a cross-sectional study of factors associated with the intra-organizational adoption of SBIRT by nurses. This chapter will summarize the dissertation findings, address the strengths and limitations of the dissertation, and make recommendations for future research.

Summary of Key Findings

Chapter 2

The purpose of Chapter 2 was to provide an overview of existing evidence regarding the use of implementation strategies to promote the implementation of SBIRT in healthcare settings. This purpose was addressed by completing a scoping review of the literature, and eighteen articles met criteria for inclusion in the review. Most of the studies evaluating strategies to promote the reach and adoption of SBIRT were conducted in the United States, in primary care and emergency department settings, and describing the implementation of SBIRT to address unhealthy alcohol use in adults. The characteristics of these studies align with the recommendations for practice from the American College of Surgeons Committee on Trauma (2007) and

U.S. Preventive Services Task Force (2018). Less research has been conducted on the implementation of SBIRT in acute care settings. Yet the rate of substance use disorder is higher in hospitalized patients than the general public, SBIRT is effective when used in hospitalized patients, and screening and brief intervention are recommended by the Joint Commission (Center for Health Information and Analysis, 2019; McQueen et al., 2011; Joint Commission, 2019; Substance Abuse and Mental Health Services Administration [SAMHSA], 2019). This scoping review also found that most leaders train and educate stakeholders when implementing SBIRT, but most research does not address adaptation of the intervention or the engagement of patients and consumers in the implementation process. Finally, most studies identified increases in the reach and adoption of screening, but the evidence regarding the brief intervention is inconclusive, and few studies address referral to treatment.

Chapter 3

The scoping review in Chapter 2 identified a gap in the literature regarding the implementation of SBIRT in acute care settings. Additionally, investigators have evaluated anticipated barriers and facilitators to the implementation of SBIRT by acute care nurses (Broyles, Rodriguez et al., 2012), but less attention has been given to the actual implementation of SBIRT by acute care nurses. The purpose of Chapter 3 was to describe the implementation of SBIRT by direct care nurses employed on an acute care nursing unit that is in the process of implementing SBIRT. The qualitative descriptive study described in Chapter 3 included interviews with eighteen direct care nurse participants employed at fourteen different hospitals within a healthcare system. Participants in this study identified several barriers and facilitators to the adoption and

implementation of SBIRT, and these barriers and facilitators were related to the nurses' beliefs and attitudes about SBIRT, organizational factors related to SBIRT, and patients' responses to SBIRT. While several of the participants originally felt that SBIRT was "one more thing to do," most of the participants felt that SBIRT was an extension of their nursing skills that could address substance use and "plant the seed for change" in patients with unhealthy substance use. Participants in this study also identified ways to improve the implementation of SBIRT, by created a standardized process for SBIRT and incorporating SBIRT into a routine process, such as the admission process.

Chapter 4

The qualitative descriptive study described in Chapter 3 identified that even when a healthcare organization decided to implement SBIRT, not all nurses decided to incorporate SBIRT into their own individual practice. The purpose of Chapter 4 was to examine individual and organizational characteristics associated with intra-organizational adoption of SBIRT. For this cross-sectional study, only the first component of SBIRT (i.e., screening with a validated tool) was assessed. Two hundred twenty-two nurses participated in this study, and the participants worked at 14 acute care hospitals in a healthcare system. In this study, participants reported favorable perceptions of the leadership and organizational capacity to implement evidence-based practice (EBP), and participants also reported favorable attitudes about EBP and openness for innovation. Yet nearly half of the participants did not use the screening tools in practice as often as expected by the organization. Participants. who reported that they were trained to use the screening tools and participants who reported that their peers had high usage of the tools

in practice were significantly more likely to report that they themselves had high use of the tools in practice.

Strengths and Limitations

There are several strengths of this dissertation. The methods used in this dissertation provided a multi-faceted approach to studying the adoption and implementation of SBIRT. The scoping review method provided a structure to methodically select articles for inclusion in the review, extract data and summarize data. By including articles from all healthcare settings, investigators identified gaps in the literature regarding the implementation of SBIRT in acute care settings. In the qualitative descriptive study described in Chapter 3, several direct care nurses from multiple hospitals participated, and data analysis revealed barriers and facilitators to the implementation of SBIRT in the participants' own words. In the quantitative study described in Chapter 4, the factors that facilitate or hinder implementation identified in may be directly applicable to nurses and other healthcare providers who would like to implement SBIRT at their hospitals.

There are also several limitations to this dissertation. A scoping review provides an overview of the existing evidence, but this method does not appraise the quality of the evidence or synthesize the evidence. Both the qualitative descriptive study and cross-sectional study were conducted with nurses at acute care hospitals within the same healthcare system. Nurses who work at this system may differ from other nurses, and the organizational context at this healthcare system may have also influenced the results of both studies. A cross-sectional method is also limited in that it does not assess changes in variables over time. Finally, the cross-sectional survey asked nurses to recall their

intentions and behaviors from the past, and this data collection method is subject to recall bias.

Implications

This dissertation advances knowledge regarding the implementation of SBIRT, and there are implications for practice and research. Nurses, other healthcare providers, and leaders in healthcare settings can use strategies described and summarized in Chapter 2 to promote the reach and adoption of SBIRT. Additionally, the barriers and facilitators to implementation described in Chapter 3 may lead to the use of targeted strategies to prevent or minimize those factors that hinder the implementation of SBIRT and promote those factors that enable the implementation of SBIRT. For example, leaders may ensure that training and education about SBIRT emphasizes the ability to plant the seed for change in patients, even though the long-term outcomes may not be visible. The results of the cross-sectional study described in Chapter 4 indicate that leaders and champions should ensure that all nurses are trained to use SBIRT, and that the baseline needs assessment includes an assessment of the frontline providers' perceptions of the intervention.

Further research is needed on the implementation of SBIRT in acute care hospitals, and the use of strategies to adapt the intervention to fit the organizational context. Additionally, further research is needed on the engagement of patients and other consumers in the implementation process. Implementation is an ongoing process, and nurses' perceptions, attitudes, intentions, and behavior may change over time. Further research should evaluate nurses' intentions to use SBIRT and actual use of SBIRT in practice during the adoption, implementation, and sustainment of SBIRT.

Conclusion

SUD is a chronic health problem that leads to adverse effects for individuals, families, and society as a whole. Nurses can intervene to prevent and address SUD by using SBIRT in practice. While the implementation of SBIRT and other evidence-based interventions is challenging, this dissertation identified strategies to support the reach and adoption of SBIRT, gaps in the literature, barriers and facilitators to the implementation of SBIRT, and individual and organizational characteristics related to intra-organizational adoption of SBIRT.

APPENDICES

Appendix A
Data Collection Tool for Scoping Review

Article information	
Article number First author Year of publication	
Screening	
Check the inclusion/exclusion criteria that apply for this article (choose all that apply)	Inclusion criteria: - English - Empirical evidence - Implementation of SBIRT - Healthcare setting - Describes implementation strategies - Measures an outcome of interest (number or percentage of: programs using SBIRT, providers using SBIRT, or patients receiving SBIRT) - Comparison of the outcome(s) such as pre-post data, longitudinal data, or control group Exclusion criteria: - Abstract/poster - Dissertation - SBIRT for something other than substance use
Does this article meet ALL inclusion criteria and NONE of the exclusion criteria?	Yes No Unsure- would like to discuss

Data from eligible articles	
Theory or conceptual model (choose all that apply)	Consolidated Framework for Implementation Research (CFIR) Greenhalgh's model: Diffusion of Innovations Roger's Diffusion of Innovation RE-AIM Theory of Planned Behavior None Other:
Study design (as stated by authors)	Qualitative Randomized controlled trial Cross-sectional/pooled cross-sectional Pre-post Mixed-methods Design not stated by authors Other:
If the authors did not explicitly state the design, what is your best guess of the study design?	Qualitative Randomized controlled trial Cross-sectional/pooled cross-sectional Pre-post Mixed-methods Design not stated by authors Other:
Location (choose all that apply)	United States Canada England Australia Other:
Setting (choose all that apply)	Acute care Behavioral health Substance abuse facility Primary care Trauma center Emergency department Federally Qualified Health Center (FQHC) Educational setting (but students/clinicians actually used SBIRT in clinical practice) Other:

Sites of study	One site Multiple sites Not applicable
Is SBIRT being delivered to a specific population?	Not a specific population Pediatrics/adolescent Pregnant patients Other:
What implementation strategy categories are being used? (Waltz et al., 2015) (choose all that apply)	Use evaluative and iterative strategies Provide interactive assistance Adapt and tailor to context Develop stakeholder interrelationships Train and educate stakeholders Support clinicians Engage consumers Utilize financial strategies Change infrastructure
What were the implementation strategies?	
Who is using SBIRT/providing SBIRT to patients (choose all that apply):	The organization (e.g. hospital, primary care facility, etc) Physician Resident Advanced practice registered nurse Nurse (RN) Social worker Patient Student- Medical student Student- APRN student Student- RN student Student- Social work student Other:
Study sample size and type (examples: 14 facilities, 4,543 patients; 352 nurses)	
What where the outcomes related to implementation (# or % of: programs using SBIRT, providers using SBIRT, patients receiving SBIRT)	

Appendix B
Semi-structured Interview Guide

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1. Introductions

2. Review study aim
The aim of this study is to describe if and how nurses employed on a nursing unit decide to use and actually use Screening Brief Intervention Referral to Treatment (SBIRT). As you know SBIRT is being implemented on your unit to recognize, intervene and refer people admitted to your unit with risky alcohol, tobacco, and substance use. As nurses such as yourself are asked to use SBIRT with patients in your everyday practice, we would like to hear about your experiences (both positive and negative) with deciding to use or not use SBIRT. We are not evaluating your use of SBIRT.

3. Review expectations of the interview
- Researcher will ask questions about the nurse's experience with SBIRT
- Confirm eligibility criteria (Scheduled to work >20 hours per week, employed on a SBIRT study unit, worked on this unit since at least March 1, 2018)
- The interview will be audio recorded, and only the researchers and transcriptionists will hear the recording
- Once the audio recording has been transcribed, the audio recording will be destroyed
- Only the researchers and transcriptionists will have access to the transcription of the interview
- The aggregate summary of all interviews (~30) will be shared with leaders at IU Health, and some individual's quotes may be included to illustrate the summary, but personal identifying information (name, years of experience, hospital of employment, age, etc) will not be shared
- The interviewee can skip any questions that you are not comfortable answering
- "Do you have any questions about the study or the interview?"
- "Do you agree to participate in this interview?"

Introductory Questions

1. Tell me about how familiar you were with SBIRT before it was implemented on your unit.
2. What are your thoughts generally about the SBIRT process?
3. Tell me about the training you received in SBIRT.
4. Tell me how SBIRT was first introduced on your unit. What was the process that occurred? What did you think about SBIRT use when you first heard about it?

Adoption: Decision to Use SBIRT

5. Have you used SBIRT with patients?
***Note: identify which components of SBIRT (screening, brief intervention, referral to treatment) the participant uses in practice. Questions 6 through 13 should be tailored based on the participant's practice.*

6. If yes – How did you decide to use SBIRT?
7. If no – How did you decide not to use SBIRT?

Implementation: Use of SBIRT

8. Tell me about a time you used SBIRT that you felt it went well?
9. Tell me about a time when you used SBIRT that it did not go well?
10. Describe what it is like for you to use SBIRT? How comfortable or confident do you feel using it?
11. What skills do you feel are important for nurses to have to use SBIRT? Describe your own skills using SBIRT.
12. What barriers have you run into using SBIRT? Tell me about a time if any when those barriers came into play.
13. What helps you use SBIRT? Tell me about a time if any when your use of SBIRT was facilitated by something or someone.
14. Overall have you found SBIRT to be a useful process?

Sustainability and Spread

15. Do you intend to continue to use SBIRT in your practice? Why or why not?
16. If you had to give advice to those in your organization who plan to spread SBIRT across all units, what would that advice be?

Demographic data

Age; gender; years of RN experience; years of experience on this nursing unit; shift scheduled to work (days, nights, weekday, weekend); highest degree obtained

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Appendix C
Sensitivity Analysis

Model 1[a,b,c] (n=222)

	Log odds	Odds Ratio (OR)	95% Confidence Interval (CI) for OR
Intercept	-2.966	.052	
Leadership	-.306	.737	.406, 1.337
Organizational capacity	.247	1.280	.909, 1.803
Receiving training			
Yes	1.535*	4.640	1.937, 11.113
(No)[1]			
EBP Attitudes	-.007	.993	.948, 1.039
Innovativeness	.006	1.006	.921, 1.099
Peer usage			
High usage	3.821**	45.642	17.616, 118.255
(Not high usage)			
Age	-.006	.994	.942, 1.050
Years of experience	-.026	.974	.914, 1.039
Years on this unit	.105*	1.111	1.008, 1.224
Highest nursing degree			
Diploma/Associate's	.235	1.265	.502, 3.188
(Bachelor's or higher)			
Certification status			
Certified	-.398	.672	.274, 1.644
(Not certified)			
Ethnicity			
Hispanic/Latino	.396	1.486	.156, 14.149
(not Hispanic/Latino)			
Race			
Black	1.453	4.278	.689, 26.576
Other	2.556*	12.885	1.568, 105.891
(White)			
Sex			
Male	-.623	.536	.092, 3.116
(Female)			

[1]Reference category in parentheses
* $p < 0.05$
**$p < 0.001$

a. Dependent variable = behavior, 'high use' defined as respondent answered "usually" or "every time"
b. Non-hierarchical
c. Non-responses to demographic data were replaced with mean or most common category

Model A[a,b,c] (n=222)

	Log odds	OR	95% CI for OR
Intercept	-8.664**	.000	
Leadership	.064	1.066	.528, 2.155
Organizational capacity	.563*	1.755	1.154, 2.670
Receiving training			
Yes	1.326*	3.768	1.313, 10.813
(No)[1]			
EBP Attitudes	.009	1.009	.962, 1.058
Innovativeness	-.008	.992	.894, 1.101
Peer usage			
High usage	4.023**	55.847	13.535, 230.437
(Not high usage)			
Age	.085*	1.088	1.023, 1.157
Years of experience	-.031	.970	.907, 1.036
Years on this unit	-.020	.980	.887, 1.082
Highest nursing degree			
Diploma/Associate's	-.449	.638	.213, 1.914
(Bachelor's or higher)			
Certification status			
Certified	.291	1.337	.515, 3.471
(Not certified)			
Ethnicity			
Hispanic/Latino	-.660	.517	.022, 12.218
(not Hispanic/Latino)			
Race			
Black	-19.729	.000	.000, .
Other	-.989	.372	.044, 3.153
(White)			
Sex	-19.570	.000	.000, .
Male			
(Female)			

[1]Reference category in parentheses

* $p < 0.05$

** $p < 0.001$

a. Dependent variable = behavior, 'high use' defined as respondent answered "every time"
b. Non-hierarchical
c. Non-responses to demographic data were replaced with mean or most common category

Model B[a,b,c] (n=222)

	Log odds	OR	95% CI for OR
Intercept	-3.710	.024	
Leadership	.034	1.035	.586, 1.826
Organizational capacity	.007	1.007	.708, 1.431
Receiving training			
Yes	1.056*	2.875	1.255, 6.584
(No)[1]			
EBP Attitudes	-.007	.993	.948, 1.039
Innovativeness	.048	1.050	.961, 1.146
Peer usage			
High usage	4.079**	59.059	20.477, 170.331
(Not high usage)			
Age	-.040	.961	.910, 1.015
Years of experience	.034	1.034	.964, 1.110
Years on this unit	.070	1.073	.971, 1.186
Highest nursing degree			
Diploma/Associate's	.540	1.715	.658, 4.472
(Bachelor's or higher)			
Certification status			
Certified	-.194	.824	.340, 1.999
(Not certified)			
Ethnicity			
Hispanic/Latino	-.783	.457	.066, 3.147
(not Hispanic/Latino)			
Race			
Black	1.963	7.121	.893, 56.757
Other	4.026*	56.022	2.924, 1073.227
(White)			
Sex			
Male	-.030	.971	.162, 5.803
(Female)			

[1]Reference category in parentheses

* $p < 0.05$

**$p < 0.001$

a. Dependent variable = behavior, 'high use' defined as respondent answered "frequently," "usually" or "every time"
b. Non-hierarchical
c. Non-responses to demographic data were replaced with mean or most common category

Model C[a,b,c] (n=222)

	Log odds	OR	95% CI for OR
Intercept	-2.693	.068	
Leadership	-.296	.744	.398, 1.391
Organizational capacity	.247	1.280	.884, 1.854
Receiving training			
Yes	1.650**	5.210	2.081, 13.042
(No)[1]			
EBP Attitudes	-.005	.995	.949, 1.043
Innovativeness	-.004	.996	.908, 1.093
Peer usage			
High usage	3.851**	47.036	16.893, 130.970
(Not high usage)			
Age	-.013	.987	.933, 1.045
Years of experience	-.019	.981	.917, 1.049
Years on this unit	.105*	1.111	1.003, 1.231
Highest nursing degree			
Diploma/Associate's	.122	1.130	.435, 2.932
(Bachelor's or higher)			
Certification status			
Certified	-.434	.648	.253, 1.661
(Not certified)			
Ethnicity			
Hispanic/Latino	.496	1.642	.162, 16.670
(not Hispanic/Latino)			
Race			
Black	1.555	4.736	.673, 33.324
Other	2.552*	12.838	1.343, 122.724
(White)			
Sex			
Male	-.512	.599	.100, 3.578
(Female)			

[1]Reference category in parentheses

* $p < 0.05$

** $p < 0.001$

a. Dependent variable = behavior, 'high use' defined as respondent answered "usually" or "every time"
b. Hierarchical with random intercept for facility
c. Non-responses to demographic data were replaced with mean or most common category

Model D[a,b,c] (n=206)

	Log odds	OR	95% CI for OR
Intercept	-3.820	.022	
Leadership	-.195	.823	.436, 1.553
Organizational capacity	.231	1.260	.873, 1.817
Receiving training			
Yes	1.193*	3.297	1.283, 8.472
(No)[1]			
EBP Attitudes	.001	1.001	.954, 1.051
Innovativeness	.004	1.004	.916, 1.100
Peer usage			
High usage	3.971**	53.056	19.456, 144.680
(Not high usage)			
Age	-.002	.998	.943, 1.057
Years of experience	-.014	.986	.918, 1.058
Years on this unit	.109*	1.115	1.004, 1.238
Highest nursing degree			
Diploma/Associate's	.262	1.299	.490, 3.443
(Bachelor's or higher)			
Certification status			
Certified	-.358	.699	.264, 1.849
(Not certified)			
Ethnicity			
Hispanic/Latino	1.534	4.638	.318, 67.704
(not Hispanic/Latino)			
Race			
Black	1.448	4.254	.651, 27.813
Other	2.210*	9.116	1.068, 77.845
(White)			
Sex			
Male	-.700	.496	.082, 2.990
(Female)			

[1]Reference category in parentheses

* $p < 0.05$

** $p < 0.001$

a. Dependent variable = behavior, 'high use' defined as respondent answered "usually" or "every time"
b. Non-hierarchical
c. Non-responses to demographic data were removed from data analysis

Model E[a,b,c] (n=222)

	Log odds	OR	95% CI for OR
Intercept	-4.841*	.008	
Leadership	.394	1.483	.821, 2.678
Organizational capacity	.126	1.134	.792, 1.624
Receiving training			
Yes	1.561**	4.762	2.013, 11.270
(No)[1]			
EBP Attitudes	.019	1.019	.975, 1.065
Innovativeness	.020	1.020	.931, 1.117
Peer usage			
High usage	3.649**	38.427	14.283, 103.380
(Not high usage)			
Age	-.009	.991	.937, 1.048
Years of experience	-.017	.984	.914, 1.058
Years on this unit	.034	1.034	.936, 1.143
Highest nursing degree			
Diploma/Associate's	-.020	.980	.374, 2.571
(Bachelor's or higher)			
Certification status			
Certified	-.618	.539	.219, 1.329
(Not certified)			
Ethnicity			
Hispanic/Latino	.789	2.201	.188, 25.792
(not Hispanic/Latino)			
Race			
Black	-.469	.625	.101, 3.861
Other	1.317	3.731	.435, 32.000
(White)			
Sex			
Male	.674	1.963	.363, 10.598
(Female)			

[1]Reference category in parentheses

* $p < 0.05$

** $p < 0.001$

a. Dependent variable = intention, 'high use' defined as respondent answered "usually" or "every time"
b. Non-hierarchical
c. Non-responses to demographic data were replaced with mean or most common category

Model F[a,b,c,d] (n=222)

	Log odds	Odds Ratio (OR)	95% CI for OR
Intercept	-2.393**	.091	
Receiving training			
Yes	1.371*	3.941	1.809, 8.585
(No)[1]			
Peer usage			
High usage	3.370**	29.066	13.493, 62.613
(Not high usage)			

[1]Reference category in parentheses

* p <0.05

**p< 0.001

a. Dependent variable = behavior, 'high use' defined as respondent answered "usually" or "every time"
b. Non-hierarchical
c. Non-responses to demographic data were replaced with mean or most common category
d. Backwards selection

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CURRICULUM VITAE

Kelli Marie Thoele

Education

Doctor of Philosophy June 2020
Indiana University, Indianapolis, IN
Major: Nursing
Minor: Health Policy and Management

Master of Science in Nursing December 2013
Indiana University, Indianapolis, IN
Adult-Gerontology Clinical Nurse Specialist

Bachelor of Science December 2005
Purdue University, West Lafayette, IN
Major: Nursing
Minors: Psychology and Biological Sciences

Professional Experience

Predoctoral Fellow, Robert Wood Johnson Future of Nursing Scholar 2017-2020
Indiana University- Purdue University Indianapolis

Clinical Nurse Specialist (supplemental position) 2017-2019
Indiana University Health

Clinical Nurse Specialist 2013-2017
Indiana University Health

Registered Nurse 2006-2017
Indiana University Health

Certifications and Licensure

Blood & Marrow Transplant Certified Nurse (expires 12/31/2022)
Oncology Nursing Credentialing Corporation

Adult Health Clinical Nurse Specialist (expires 6/3/2024)
American Nurses Credentialing Center

Oncology Certified Nurse (expires 12/31/2021)
Oncology Nursing Credentialing Corporation

Registered Nurse (expires 10/31/2021)
Indiana State Board of Nursing

Academic and Professional Honors

Chancellor's Scholar, Honorable Mention 2020
Indiana University-Purdue University Indianapolis

Premier 10 and Elite 50 2019
Indiana University-Purdue University Indianapolis

Dayhoff/Lyon Outstanding Clinical Nurse Specialist Student 2014
Indiana University-Purdue University Indianapolis

Clarian Health Gold Performance Award, Clinical Excellence 2008
Clarian Health

Publications

Thoele, K., Ferren, M., Moffat, L., Keen, A., & Newhouse, R. (pending). Development of a toolkit to facilitate implementation of an evidence-based intervention. *Implementation Science Communications*.

Keen, A., Thoele, K., Newhouse, R. (in press). Variation in SBIRT delivery among acute care facilities. *Nursing Outlook.* https://doi.org/10.1016/j.outlook.2019.09.001

Thoele, K. (in press). Professional practice. In S. Eisenberg & K. Schmit-Pokorny (Eds.), *Hematopoietic stem cell transplantation: A manual for nursing* practice (3rd edition.). Pittsburgh, PA: Oncology Nursing Society.

Keen, A., Thoele, K., Fite, L., & Lancaster, S. (2019). Competent patient refusal of nursing care: An innovative approach to a complex problem. *Journal of Wound, Ostomy and Continence Nursing, 46*(5), 390-395. https://doi.org/10.1097/WON.0000000000000569

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Newhouse, R., Janney, M., Gilbert, A., Agley, J., Bakoyannis, G., Ferren, M., Mullins, C. D., Johantgen, M., Schwindt, R., & Thoele, K. (2018). Study protocol testing toolkit versus usual care for implementation of screening, brief intervention, and referral to treatment in hospitals: A phased cluster randomized approach. *Addiction Science & Clinical Practice*, *13*:28. https://doi.org/10.1186/s13722-018-0130-4

Thoele, K., Piddoubny, M., Ednalino, R., & Terry, C. L. (2018). Optimizing drug delivery of small-volume infusions. *Journal of Infusion Nursing, 41*(2), 113-117. https://doi.org/0.1097/NAN.0000000000000268

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Whited, L., Grove, M., Rose, D., Rhodes, N. J., Scheetz, M. H., O'Donnell, J. N., Neeb, J., Thoele,K**.,** Jones, D.R., Lowe, C., Moore, D., & Kiel, P. J. (2016). Pharmacokinetics of cefepime in cancer patients with febrile neutropenia following chemotherapy treatment in the setting of hematologic malignancies or hematopoietic cell transplantation. *Pharmacotherapy, 36(9), 1003-1010.* https://doi.org/10.1002/phar.1807

Thoele, K. (2014). Engraftment syndrome in hematopoietic stem cell transplantations. *Clinical Journal of Oncology Nursing, 18*(3), 349-354. https://doi.org/10.1188/14.CJON.349-354

Presentations

Crowder, S., Maxey, H. L., Oruche, U., Afuseh, E., Keen, K., Thoele, K., & Newhouse, R. (2020, February). *Improving access and quality through comprehensive workforce planning for people that use substances.* Poster presentation at the AcademyHealth National Health Policy Conference, Washington DC.

Thoele, K., Ferren, M., Lam-Chi, M., & Lord, L. (2019, December). *Implementation science: Studying how nurses institute changes in practice.* Podium presentation at the Indiana University Health 45th Annual Nursing Research Conference, Indianapolis, IN.

Keen, A., Thoele, K., & Newhouse, R. (2019, November). *Screening, brief intervention, and referral to treatment implementation localization*. Podium presentation at the Sigma Theta Tau 45th Biennial Convention, Washington DC.

Thoele, K., Clere, E. D., & Crowder, S. J. (2019, November). *Clinical nurse specialists as change agents in state health policy: Lessons from a legislative fellowship.* Poster session presented at the Central Indiana Organization of Clinical Nurse Specialists 9th Annual Conference, Greenwood, IN.

Thoele, K., Draucker, C. B., & Newhouse, R. (2019, November). *Implementation of screening, brief intervention, and referral to treatment (SBIRT): A qualitative descriptive study.* Poster session presented at the Indiana Center for Nursing conference, Indiana Nursing Summit: One Voice, Indianapolis, IN.

Newhouse, R., Thoele, K. Ferren, M., & Konicek, S. (2019, October). *Evidence-based health system: Clinical interventions and multiple implementation strategies key to evidence use.* Podium presentation at the Magnet Research Symposium, Orlando, FL.

Newhouse, R., & Thoele, K. (2019, April). *Does implementing SBIRT improve care and referral of hospital patients who use tobacco, alcohol or non-prescription drugs?* Podium presentation at the Opioid Data to Action: Combating Addiction through Innovation Conference, Indiana Convention Center, Indianapolis, IN.

Thoele, K. (2018). *Development of standardized education for central line care and reflections on CNS practice.* Classroom presentation at Indiana University School of Nursing, Indianapolis, IN.

Thoele, K., Delamater, L., & Allison, A. (2017). *From implementation to dissemination: The basics of writing and presenting.* Podium presentation at the Indiana University Health Nurse Research Conference, Indianapolis, IN.

Walden, B., Gardner, D., Gardner, S., Thoele, K., Keen, A., Fite, L. & Lancaster, S. (2016). *Review of the literature: Competent patient's refusal of nursing care.* Poster presentation at the Indiana University Health Nurse Research Conference, Indianapolis, IN.

Thoele, K., & Ednalino, R. (2016). *Good to the last drop: Using A3 thinking to solve the problem of small volume infusions.* Poster session presented at the Indiana University Health Leadership Development Institute, Indianapolis, IN.

Neeb, J., Thoele, K., & Ferren, M. (2016). *Transitioning care delivery models: Leadership structure supports change and positive outcomes.* Podium presentation at the American Organization of Nurse Executives Conference, Fort Worth, TX.

Thoele, K., Seo, S., Root, C., & Davis, E. (2015). *Direct care nurse involvement in quality improvement: Central line dressing change frequency.* Poster presentation at the Indiana University Health Nursing Research Conference, Indianapolis, IN.